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MILITARY ASPECT OF STATUS LYMPHATICUS

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During the past thirty years it has been the conclusion of many pathologists who have carefully observed the general configuration of the cadaver at necropsy that the fate of the human body is not a matter of chance but in general is controlled by certain intrinsic physical tendencies that are of congenital origin.

This conclusion is merely in line with the doctrine of a constitutional predisposition to disease, the importance of which has been submerged by the advent of the germ theory. Clinical observers, especially in recent times, have not been so much impressed with the importance of constitutional factors doubtless because the most definite evidences of such tendencies are revealed chiefly at necropsy, and possibly also because the modern clinician is greatly occupied by a multitude of laboratory tests and aids to diagnosis and prognosis, which apply without regard to any constitutional basis of disease.

Recently, the experience of the Medical Department of the Army has revealed in a highly impressive way the fact that, under the stress of military life, certain physical factors which escape ordinary physical examination soon declare themselves most emphatically, with the result that numbers of apparently healthy men die, or break down and are incapacitated, and become a burden instead of an asset in the military force. Any one who has the slightest conception of the general factors leading to disease cannot fail to recognize that anatomic defects are chiefly responsible for the recent discoveries of "irritable heart," "irritable thyroid," nervous instability, functional shell shock, etc. It also seems highly probable, and I have some concrete pieces of evidence to show, that in a great variety of conditions the stress of military life is bringing into action the inevitable force of constitutional tendencies in the unexpectedly fatal outcome of many common diseases and traumas.

Since constitutional defects cannot be remedied, it is of practical importance chiefly to inquire whether there is any way in which they can be recognized, and whether there are any means of avoiding their hazards.

In one form of constitutional dyscrasia, status lymphaticus, it is possible to recognize the pronounced forms during life, and to a considerable degree to avoid its special dangers. I believe that it is of considerable importance that the attention of military medical men, beginning with medical exemption boards, be sharply drawn to the stigmata of status lymphaticus, both for the purpose of establishing rules of procedure in the disposition of such cases, and in order to gather new information regarding the significance of status lymphaticus from the military standpoint, and also in order that the military physician may enjoy the intellectual satisfaction of understanding certain events occurring in the course of disease and injury that are generally quite obscure.

ANATOMIC CHARACTERS

Status lymphaticus is characterized by a feminine type of bodily conformation in the male, absence of axillary and deficiency of pubic hair, general delicacy of integument, a tendency toward abundant deposits of subcutaneous fat, evidence of rickets, small size of the heart and thinness of aorta and other arteries, persistence of thymus, and hyperplasia of lymphatic tissues in tonsillar ring, ileum and spleen.

Two phases of these physical characters are recognized, in children and in adults, the latter being a recessive stage of the former. In infants and before puberty, lymphatic hyperplasia, large thymus, and signs of rickets are prominent, while in adults the lymphatic hyperplasia is gradually succeeded by atrophy and by a form of sclerosis which Bartels[1] says is peculiar. In adults the unfolding of the growth tendencies of the body brings out the feminine characters of the male physique, and often the persistence of the thymus, while necropsy discloses hypoplasia of the heart and the arterial system.

The scope of the anatomic changes included by many observers in status lymphaticus is considerable. The body is gracefully formed, the limbs rounded, the thorax long, the pelvis heterosexual. Pribram[2] includes genu valgum, persistence of epiphyseal lines, flatfoot, and hyperextensibility of the elbow joints. He found that the outstretched arms exceed the body length in 95 per cent. of the cases, but this relation often occurs without status lymphaticus.

The genitals are hypoplastic (46 per cent.), and cryptorchidism may occur (from 2 to 3 per cent.). Kyrle[3] observed that the testes were usually normal in the gross, but presented well marked interstitial orchitis, without much disturbance of spermatogenesis or alteration of interstitial cells. In certain cases the testes are atrophic. In fifty-five cases Herrmann[4] found the ovaries usually enlarged and much elongated from interstitial fibrosis. Axillary and thoracic hair

1. Bartels: Wien. klin. Wchnschr., 1908, p. 1826; Tuberculosis, 1913, **12**, 561.
2. Pribram: Ztschr. f. klin. Med., 1914, **81**, 120.
3. Kyrle: Centralbl. f. Physiol., **23**.
4. Herrmann: Centralbl. f. Physiol., **23**.

is scanty or absent, and the pubic hair in the male ends in a horizontal line, as in the female (96 per cent.). The beard is scanty (57 per cent.), and sternal hair absent (90 per cent.). The hair of the limbs is scanty or absent (65 per cent.).

The skin is delicate. There is a tendency toward abundance of subcutaneous fat, and some subjects are distinctly obese. In certain cases with distinctly atrophic genitals, status lymphaticus is associated with eunuchoidism. In the obese eunuchoids described by Tandler and Gross,[5] persistence of the thymus was believed to exist because of roentgen shadow, but the exact relations of eunuchoidism to status lymphaticus remain to be determined. Very pronounced feminine characteristics belong chiefly to the former condition.

Fig. 1.—Partially developed status lymphaticus in man, aged 21. Patient has shaved only twice. Pubic hair of feminine type. Long, slender thorax.

Fig. 2.—Status lymphaticus of feminine type; genitals apparently normal. Photograph lent by Dr. Charles Norris.

Fig. 3.—Eunuchoidism, a condition probably involving status lymphaticus, in man, aged 22; feminine body; hypoplasia of genitals. (After Saenger.)

In the female the external signs of status lymphaticus may be limited to thinness and delicacy of skin, narrow waist, arched thighs, and scanty hair. Menstruation is usually delayed, the uterus may be infantile, and the breasts poorly developed.

In children the thymus enlargement may be the most prominent feature, and thymic pressure has probably been one of the chief factors leading to the death of infant subjects of status lymphaticus. This organ persists in many young and some older adults, as one of the most significant signs of status lymphaticus. It shows simple lymphoid hyperplasia, and the process may affect aberrant lobes in the neck or in the thyroid gland. Through its relation to the thyroid it is believed to figure prominently in the cases of status lymphaticus with thyroid manifestations. In most adult subjects the thymus is small or atrophic.

The lymphatic hyperplasia occurs in infants and children up to and sometimes beyond puberty, and is often a most distinctive feature, differing from any other known form of lymphatic overgrowth. The pharyngeal ring of lymph follicles is enlarged (80 per cent.), the lingual follicles being affected more than the faucial tonsils. Rarely the cervical nodes are slightly swollen. Very striking overgrowth of Peyer's patches, especially the lowest, is frequently observed. The splenic follicles are enlarged and plainly visible to the naked eye. Swelling of mesenteric nodes is occasionally seen. The structural changes consist in overgrowth of lymph follicles and lymphocytes. Symmers[6] emphasizes the presence in many cases of degenerative and even necrotic changes in the centers of follicles, and of sclerosis which follows these changes.

Hypoplasia of the heart and aorta is the most prominent of the conditions found at necropsy. There are no systematic data regarding the weight of the heart in status lymphaticus, but the organ is usually distinctly undersized. The aorta is thin and delicate, often to a striking degree. Delicacy of the entire arterial system may exist and form the basis of apoplexy in young adults, and of various functional disorders. Some observers have attributed to the overstraining of a small heart certain forms of interstitial myocarditis occurring with status lymphaticus. With the hypoplasia of heart and aorta Virchow associated chlorosis, which may occur in subjects of status lymphaticus.

Many other abnormalities in the construction of organs are occasionally seen, as lobulated kidneys, hypospadias, polymastia, abnormal fissures, and congenital angiomas, but they are not sufficiently frequent to be regarded as essential. They seem to support the view that some fundamental defect of development exists in these subjects.

OCCURRENCE

Since there are all grades of status lymphaticus, its frequency will depend somewhat on the attitude of the observer. Two statistical studies are available.

Emerson[7] analyzed his own and Norris' observations at Bellevue Hospital. Among 3,600 necropsies, 288 (8 per cent.) showed status lymphaticus, 70.2 per cent.

5. Tandler and Gross: Arch. f. Entwickelungsmech., 1910, **29**, 290.

6. Symmers, Douglas: Am. Jour. Med. Sc., 1918, **156**, 40; The Cause of Sudden Death in Status Lymphaticus, Am. Jour. Dis. Child., December, 1917, p. 463.

7. Emerson: Tr. Internat. Cong. Inter. Med., 1914, Med. Sec., **6**, Pt. 2, p. 165.

active and 29.8 per cent. recessive; 9 per cent. failed to show any other cause of death, and 242 died of infectious diseases. Recently Symmers has collected the Bellevue Hospital material, finding 457 cases of status lymphaticus among 5,652 necropsies. Of these, 249 were analyzed, showing that 118 were active, 89 recessive and 42 partial or intermediate. It was most frequent between 20 and 40 years. Pribram observed several of the clinical signs of status lymphaticus in 150 among 2,500 patients at von Jaksch's clinic (6 per cent.).

Municipal hospitals, gathering a large number of sudden deaths, show a relatively high proportion. It is obvious that the condition must appear highly important to medicolegal observers, while for the same reasons the general practitioner commonly ignores it, or more often has never had it brought to his attention.

Woodward seems to have suspected that small hearts were connected with sudden deaths. He referred to sudden deaths of convalescents from dysentery, often while the patients were walking about, and in ten of these the heart was noted as small, in four cases weighing 5½ ounces or less. No cause of death was discovered. Among the general cases of undetermined causes of death, twenty showed small hearts, in eight of which the weight fell below 6½ ounces, once to 4 ounces.[8] I am unable to find any other reference to this condition in reports from the Civil War.

CLINICAL MANIFESTATIONS

Only a brief enumeration of the clinical conditions in which status lymphaticus figures can be attempted within the scope of the present report.

In infants, many cases of unexpected death, occurring instantly, or after rapidly increasing dyspnea or heart failure, have revealed only an enlarged thymus which has mechanically obstructed breathing and heart action. This so-called thymic death is one of the most numerous and best known groups of cases.

Death under anesthesia occurs, in a large proportion of cases, in subjects of well-marked status lymphaticus. Here respiratory failure precedes stoppage of the heart.

Cardiac and arterial hypoplasia dominates the clinical picture in most adult cases. The small heart, even under the most critical estimate, must reasonably be assumed to carry with it defective muscular energy and low metabolism. The subjects tire easily and suffer from palpitation, pain, cardiac dyspnea and low blood pressure, and in many cases of sudden death it has been assumed that the heart stopped beating from exhaustion or from some form of reflex inhibition. Here may be classed the numerous cases of sudden death while bathing, or after trivial mechanical trauma. Many have warned against the careless injection of alien proteins, antiserums, vaccines and arsphenamin in subjects of status lymphaticus. While in this field of functional disturbance of the hypoplastic heart the evidence is vague and inconclusive, it may at least be said that these cases are wholly without other explanation, and invite investigation by modern methods. Ortner[9] was quite sure that the small heart is particularly subject to functional disorders and subsequent myocardial changes.

Precocious apoplexy in young adults is a highly characteristic termination of status lymphaticus, is comparatively frequent, and may be expected especially in military service. Norris encountered many such cases at Bellevue Hospital. I have examined several of them collected by my colleague, Schultze, in which the cerebral vessels were extremely delicate and usually free from sclerosis. They are clearly distinguished from nephritic cases in young adults, but nephritis may be added.

In relation to infectious diseases, status lymphaticus appears to have much significance. It has long been known that these subjects do badly under infection. Elser and Huntoon[10] found that in all their fulminant cases of meningitis the patients were subjects of status lymphaticus, and this observation has been supported by others. McNeil[11] reports fulminant pneumonia with

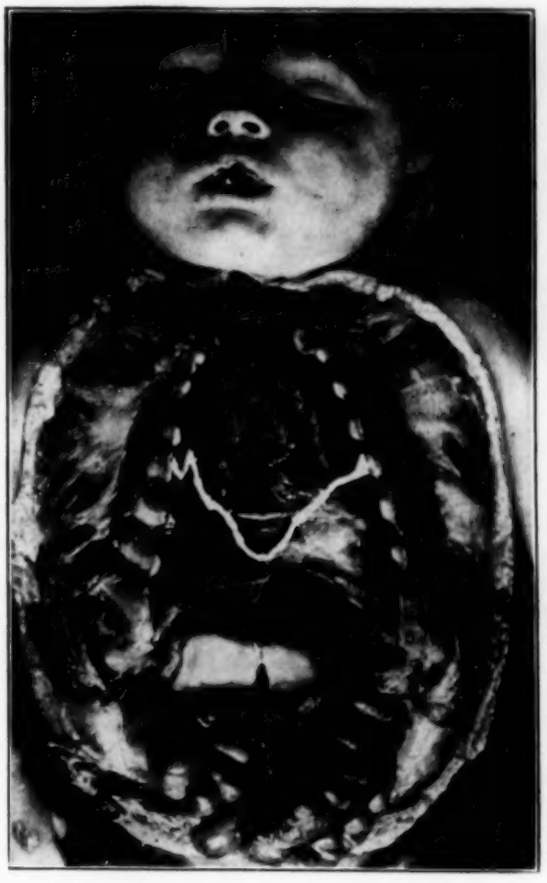

Fig. 4.—Hypertrophic thymus in a new-born infant; case of Dr. Symmers'.

status lymphaticus. Symmers reports fifty-five necropsies on meningitis, 60 per cent. in subjects of status lymphaticus. In thirty of these cases of known duration the disease was fatal in an average period of 3.4 days, and nine patients died within forty-eight hours. In thirteen subjects of status lymphaticus dying from typhoid fever, the average duration was fourteen days. In his series, about 10 per cent. of all subjects of status lymphaticus presented acute infective lesions of the heart valves. Daut[12] found that more than 25 per cent. of patients dying of diphtheria were subjects of status lymphaticus.

The relation to tuberculosis shows several phases. The combination of rickets, lymphatism and scrofula

8. Woodward: Medical History, War of the Rebellion, Med. Vol. **2**, 502.
9. Ortner: Wien. klin. Wchnschr., 1891.
10. Elser and Huntoon: Jour. Med. Research, 1905, **9**, 89.
11. McNeil: Brit. Med. Jour., 1914, **2**, 576.
12. Daut: Jahrb. f. Kinderh., 1898, **47**, 141.

in children is emphasized by Bartels. Subjects of status lymphaticus in general show a high resistance to tuberculosis, which takes the form of caseous lymphatic lesions, solitary brain tubercle, atypical bone lesions, etc. Addison's disease nearly always occurs in subjects of status lymphaticus (Bartels).

In exophthalmic goiter, thymic enlargement is very common, and practically all fatal cases show pronounced hyperplasia of the thymus and often other signs of status lymphaticus. The high mortality of operations on the thyroid may thus receive a partial explanation. Simple goiter is relatively common in status lymphaticus.

The condition in status lymphaticus appears to be identical with none of the specific disorders of the endocrine system, but there are definite indications that these glands are involved in various ways. The bodily configuration has some of the features of adiposogenital dystrophy. Many of the cases of hypophysial dystrophy of Froelich's type are associated with other and pronounced signs of status lymphaticus.[13] Hypoplasia of the genitals is a common feature in both sexes. The hyperplasia of the thymus can hardly be without some bearing on the question of its supposed internal secretion. Hypoplasia of the suprarenals is repeatedly observed. In this territory may possibly be found the key to the complete solution of the complex situation in status lymphaticus.

The nervous system is essentially concerned in status lymphaticus, but little is known of the nature of its relation. Rokitansky spoke of overdevelopment of the brain in early life in these subjects, and Bartels has noted multiple foci of gliosis with a tendency to glioma. No definite anatomic changes in the brain have been established in status lymphaticus, but the clinical data are in some respects quite impressive. Ohlmacher[14] found that the great majority of fatal cases of epilepsy are subjects of status lymphaticus. The condition is relatively common in the mentally deficient. Not a few cases escape all other hazards, only to end in suicide. Bartels, from a study of 122 cases, concluded that status lymphaticus is practically constant and often pronounced in subjects of suicide. Miloslavic[15] studied 110 cases of suicide in military service, finding 80 per cent. with signs of status lymphaticus, as follows: thymolymphatic, 47 per cent.; lymphatic, 21 per cent.; thymic, 8.5 per cent.; partial, 3.5 per cent.

Symmers found pronounced hypoplasia of heart and aorta in all of five cases of caisson disease. This observation falls in line with others which indicate that the entire cerebral vascular system in these subjects is defective. It may be of importance in aviation.

Fig. 5.—Hyperplasia of lowest Peyer's patch in status lymphaticus. From the author's case of chloroform death (1897).

PATHOGENESIS

The central factors in the origin of status lymphaticus must be found in the congenital hypoplasia of the cardiovascular system, and in hyperplasia of the thymus. Nothing is known of any hereditary element. The small heart and the blood vessels do not grow up with the body, but remain delicate and inadequate. Yet the skeleton, muscular system and organs are often highly developed in these subjects. In some respects this maladjustment may be brought into relation with a persistent and overactive thymus. Gudernatsch has shown that thymus feeding of tadpoles causes overgrowth of the body without corresponding maturation, which may be accelerated by addition of thyroid substance to the diet. Genital hypoplasia, although present in some cases, is not constant or as a rule prominent, but may be connected with a persistent thymus. Henderson[16] and Hatai have shown that the thymus tends to persist in castrated animals.

In subjects of this anatomic constitution there is evidence that external factors play a part in developing the lymphoid hyperplasia. Cameron,[17] who finds that more than 40 per cent. of the children coming to necropsy at Guy's Hospital are subjects of status lymphaticus, attributes the lymphatic hyperplasia to chronic inflammation of the various mucous membranes. He designates early status lymphaticus as status catarrhalis, or the exudative diathesis, finds the cause in poor hygiene and excessive carbohydrate feeding which favors wateriness of the tissues and rickets, and urges the remedy of correct feeding. His views deserve careful attention, but do not remove the necessity of a congenital basis of the condition. Blumer,[18] and especially Symmers, impressed by the presence of irritative hyperplasia of the lymph follicles with degeneration and necrosis, develop the idea of autointoxication, and Symmers thinks the intoxication of anaphylactic type, the system becoming sensitized by repeated discharges of lymphocytic proteins. The adjustment of this line of speculation with established principles of immunology is not entirely clear.

The question whether the enlarged thymus mechanically compresses the trachea in infants seems still undecided. That there is a reflex mechanism which stops the heart under conditions of mild nervous shock seems highly probable. Many clinical observations show that the vasomotor system of these subjects is quite unstable and very sensitive. Laryngismus is common in the children, and many fatalities are preceded by convulsions.

CLINICAL DIAGNOSIS

Well-marked cases of status lymphaticus are easily recognized by inspection of the whole body. An enlarged thymus in children or young adults may be recognized by the roentgen ray, but it is improbable that the lesser size of the simple persistent thymus can be determined by any method. The pharyngeal ring of lymph nodes is too often swollen in other conditions to serve as more than a suspicious sign. The lymphocytosis commonly present is too indefinite to be of any positive diagnostic value. I know of no observations

13. Cushing, Harvey: The Pituitary Gland and Its Disorders.
14. Ohlmacher: Bull. Ohio State Hospitals, 1898; New York Med. Jour., 1898, **68**, 443.
15. Miloslavic: Virchows Arch. f. path. Anat., 1912, **208**, 44.
16. Henderson: Jour. Physiol., 1904, **31**.
17. Cameron: Proc. Roy. Soc., 1917, **10**, No. 8, Dis. Child., p. 133.
18. Blumer: Bull. Johns Hopkins Hosp., 1903, **14**, 270.

by the roentgen ray on the appearance of the hypoplastic heart and aorta, nor of studies on the blood pressure.

The lesser grades and partial forms of status lymphaticus must probably be marked as unsafe territory, especially for the military physician. Nevertheless, when several of these less definite signs can be demonstrated in subjects of slightly developed bodily characteristics, a probable diagnosis of status lymphaticus may often be established with reasonable certainty. None of these limitations apply to the recognition of status lymphaticus at the necropsy, by the systematic examination of all the organs, followed by microscopic control.

On the other hand, the suspicion of status lymphaticus should be entertained by the military clinician, not only in the obvious cases, but in dealing with any of the manifestations mentioned above, such as irritable heart, thyroidism, nervous breakdown, epilepsy, shell shock and fulminant infectious diseases, and this suspicion should be followed to the necropsy table.

With these well-attested evidences that status lymphaticus carries with it a defective vitality that results in sudden and unexpected death in many conditions of trauma and disease, it is obvious that this dyscrasia must be of considerable importance in military medicine. It would seem desirable that intelligent efforts should be made to detect the condition whenever present, that definite procedures should be adopted when it is found, and that systematic study of the material collected by the Army medical forces should be undertaken in order to elucidate many problems that still remain unsolved regarding its origin, nature and significance:

1. In the physical examination of drafted men a pronounced grade of status lymphaticus ought to be recognized at a glance, and it would seem reasonable that the subject should be rejected as unfit for active military service. Whether it is practically or economically wise to accept such subjects for any form of military service can be determined only by systematic clinical observation of those already in the service. Such a study would occupy years, and ought to be undertaken under the favorable circumstances that exist in the Army and cannot be duplicated elsewhere.

2. In the subsequent examination of men already in the service, the presence of status lymphaticus should be noted, and these men should be assigned to the less hazardous occupations.

Fig. 6.—Hypoplasia of aorta and suprarenals, and hyperplasia of thymus in a girl, aged 20 years, dying of cerebral hemorrhage. Weight of heart, 307 gm.; thymus, 41 gm.; suprarenals, 10 gm. Aorta, widest external circumference, 5 cm. A case of Dr. Otto Schultze's.

3. In the present state of knowledge, the most substantial evidence regarding status lymphaticus and the chief source of material for study that may elucidate its problems must still be obtained from postmortem examinations. The presence of status lymphaticus should be looked for in every postmortem examination, and affirmed or negated in every protocol. The anatomic evidence of the condition should regularly be preserved for further study, and the effort be made to discover any further extensions of the anatomic changes that may possibly occur in the condition.

At present the indications point to the glands of internal secretion as most likely to throw new light on the nature of the condition. In this field histologic studies are required on the thymus, thyroid, hypophysis, pineal gland, carotid gland, pancreas, suprarenal, testis and sympathetic system. Any undertaking of this sort to be adequate can hardly omit attention to any organ in the body. The bones should be examined for old rickets, and the bone marrow for evidences of hematopoietic disorder. Since the circulatory system long retains the impress of status lymphaticus and is a specially important factor in the adult, observations on the heart, its musculature and nervous apparatus, and on the aorta and arteries are called for.

4. The clinician has an interesting task and a complex function to perform in connection with the study of status lymphaticus and in the employment of the doctrines that have accumulated about it.

The final test of the existence and importance of a bodily constitution of defective general vitality must be clinical. Since the majority of patients survive to middle life, most of them come repeatedly under clinical observation. Since there must be all grades of status lymphaticus, the condition often merges with that known as the idiosyncrasy of the patient, recognition of and respect for which constitute a substantial part of the art of medicine. In general, the clinician must determine how these subjects react to injury and disease.

Very numerous situations previously stated, showing that many patients react with sudden death, quite sufficiently impress the general clinical importance of status lymphaticus. Of the manifestations of the lesser grades of the condition little is known, and here the need of keen observation and sound clinical judgment is apparent. It would seem easy either to exaggerate or to undervalue the clinical importance of status lymphaticus. It seems not improbable that some of the

best of the world's work has been done by subjects of status lymphaticus, but in the military field that work must have been fortunately adapted to the physical defects of the worker. Therefore, it seems not necessary for the clinician to condemn every subject showing status lymphaticus, but rather to find the subject's proper place in the military organization.

Speculation which seems legitimate suggests several topics of research that may be profitable from the clinical side.

No surgeon can afford to ignore the importance of status lymphaticus in the choice and administration of anesthetics.

The employment of injections of alien proteins and of arsphenamin should be undertaken with caution in subjects of status lymphaticus.

Further observations on the course of infectious diseases in subjects of status lymphaticus are called for. The idea that a fulminant course of meningitis or pneumonia is largely determined by status lymphaticus challenges the present conceptions of most clinicians and bacteriologists, but cannot be contested except by carefully accumulated clinical data.

The resistance to tuberculosis claimed by Bartels for subjects of status lymphaticus may be determined by the clinician and the pathologist.

Not many clinicians will be prepared to accept the statement that Addison's disease occurs almost exclusively in subjects of status lymphaticus, but this question can be determined by the material collected in the Army.

Those who are interested in the doctrines of internal secretions may find profit in pursuing the relations of status lymphaticus to the ductless glands.

The neurologist meets phases of status lymphaticus notably in suicide, epilepsy and possibly in certain forms of mental disturbance. It would be interesting to know if any considerable proportion of patients with shell shock or other forms of nervous breakdown, with or without anatomic lesions, belong in the category of status lymphaticus. Given an overdelicate cerebral vascular system, one has an obvious predisposing condition to miliary or microscopic hemorrhages, such as occur in concussion and carbon monoxid poisoning. Almost the entire anatomic picture of status lymphaticus lends itself readily to the explanation of physical and mental breakdown on the battle field.

The irritable heart presents itself as a possible phase of the defective circulatory apparatus of status lymphaticus and one in which clinical observations on a large scale could be carried on.

All of these suggestions, however, must be offered with the greatest caution. Otherwise status lymphaticus may be lost in a maze of minor and ill defined clinical disorders of very doubtful relation to the very substantial anatomic alterations that appear in the bodies of pronounced cases. Such a fate seems to have overtaken neurofibromatosis at the hands of several continental writers, who have attempted to attach to this extremely specific anatomic condition all manner of disorders of the skin and nervous system.

The present conditions in the military service in America, when numerous races and classes are brought under the draft, seem to offer quite unique opportunity of determining the economic and military importance of definite status lymphaticus, and it is to this aspect of the subject, rather than to its possible ramifications, that the present note is directed.

Army Medical Museum.

SUPPURATIVE GINGIVITIS WITH ALVEOLAR INVOLVEMENT

A NEW SURGICAL PROCEDURE *

ARTHUR ZENTLER, D.D.S.

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NEW YORK

It is my intention to deal with that phase of the disease commonly known under the confusing name of pyorrhea alveolaris, which as indicated by its histopathology is a purely surgical disease and must, therefore, be treated surgically, this alone promising an expedient and a permanent cure.

Fig. 1.—Appearance before operation.

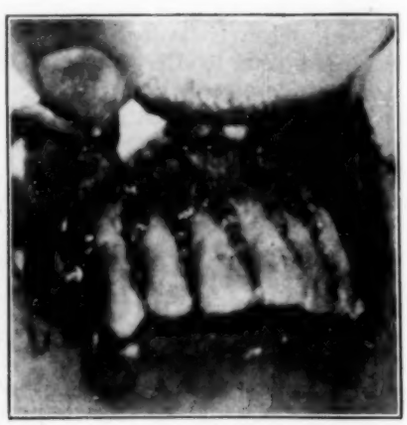

Fig. 2.—Flap lifted and retracted.

For the purpose of clear presentation, I shall briefly state that I prefer to call the diseases involving the gingivae and their soft and hard underlying and adjacent tissues by the generic name given them by Talbot, of gingivitis. Further, that for purposes of practical study, I classify gingivitis into superficial, hemorrhagic and suppurative.

The first class of the disease and the less advanced forms of the second and third classes are ordinarily amenable to proper dental treatment (scaling, polishing, etc.) in conjunction with correction of such local and constitutional disturbances as may be present.

The more advanced hemorrhagic cases, and especially the advanced suppurative cases, accompanied by degenerative processes of the alveolar bone and the soft tissues immediately covering it, are usually either traumatic, being due to long neglected accumulations of salivary calculi or other irritants (ill fitting fillings, inlays, crowns, bridges, etc.), or they are a manifestation of a disturbed metabolism due to such diseases as diabetes, syphilis, tuberculosis or chronic or acute

* Read before the Section on Stomatology at the Sixty-Ninth Annual Session of the American Medical Association, Chicago, June, 1918.

metallic toxemias, when serumal calculi may or may not be found on the roots of the teeth, and, if present, will act as an additional irritant. Whether of traumatic origin or of metabolic or of both origins, these forms of gingivitis are oral foci of infection, to which other systemic disturbances are attributed; but this phase of the subject is not to be considered here, except for the purpose of stating that it is a sine qua non that the treatment of the oral condition must go hand in hand with the treatment of the general physical condition; neither can be brought to a successful issue without a rational treatment of both.

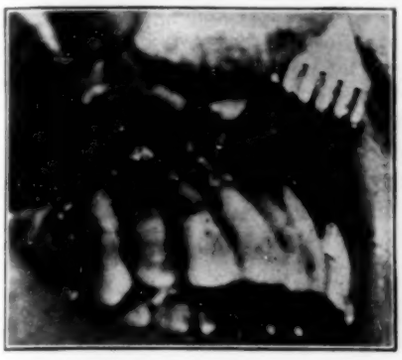

Fig. 3.—Appearance after removing all soft and hard diseased tissue.

Fig. 4.—Flap replaced and sutured.

A typical report[1] of microscopic examination of specimens of tissues obtained from areas operated on reads as follows:

> The exposed connective tissue is of sluggish granulation type, heavily infiltrated by some polynuclear and many round and plasma cells. These last cells are so dense that the stroma is obscured throughout its length inward from the epithelium. The epithelium is not remarkable except at points where it is necrotic and desquamating. There are many congested capillaries and considerable extravasation by red blood cells throughout, and several spicules of alveolar bone are seen.

This shows that the condition present is of such character as clearly to indicate that nothing short of radical removal of all the involved soft and hard structures, going well into healthy surroundings, will render the part receptive of regenerative processes and insure an ultimate permanent cure. It is clear that an essential factor in operating on any part is that its approach be unobstructed, so that before terminating the operation, the surgeon may be certain of having actually removed all that is diseased; it is seldom, if ever, when this is not accomplished, that recurrence does not take place. This probably explains the reasons why, in advanced cases of so-called pyorrhea, very few permanent cures are effected with the treatments as generally practiced at present.

G. V. Black[2] speaks of the surgical treatment of pockets, describing a method of eradicating the pocket by "cutting away as far, or a little beyond, the point to which the disease has reached, which generally means some cutting away of the margin of the alveolar process as well as the soft tissue." He speaks of there being "considerable variation in results following this treatment. The rule is, however, that something will be gained in reducing the depth of the pocket each time the overlying tissue is cut away."

From this it is seen that while the need of radically dealing by surgical methods with these cases was recognized by Black, the result was not always a success and recurrence took place; hence the need of repeated ("each time") cutting away of the pocket.

Riggs, and others since his time, operated somewhat in the way described by Black. Robitzeck of Vienna, as long ago as 1862, devised an operation for cases involving an area over several teeth, sometimes all the anterior region or the posterior region or even both regions, consisting in excising with a straight incision through the soft tissues down to the alveolar process, all the abnormally appearing gum tissue. A scraping of the exposed alveolar bone followed the excision of the soft tissue, and the patient was dismissed. In cases in which cures were effected with this treatment, the result of the straight incision was such as to leave a very unsightly aspect of the parts.

After practicing Robitzeck's operation for a number of years, I have found that it was very useful in cases of advanced hemorrhagic gingivitis and often in cases of not very advanced suppurative gingivitis. I found, however, that in somewhat modifying his technic I could obtain a more pleasing ultimate appearance and a local condition more easily kept clean.

My modification consisted in excising the diseased gum tissue, instead of by a straight incision, by following the original festoons of the gums, going well into the healthy tissue, thus leaving behind a scalloped edge, which I packed tight with a strip of folded iodoform gauze one-eighth inch wide. The ulterior healing would result in an appearance of the gum very much as if it had never been diseased, and with no signs of an operation noticeable; the gingival papillae would be practically restored.

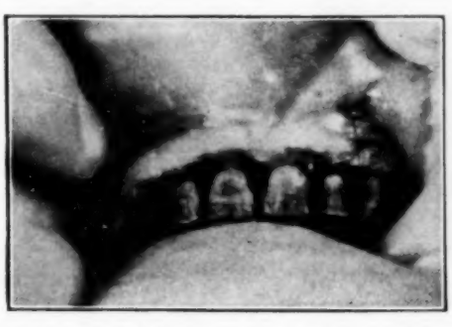

Fig. 5.—Typical appearance of upper anterior region before operation in an extensive case of suppurative gingivitis, in a patient aged 55.

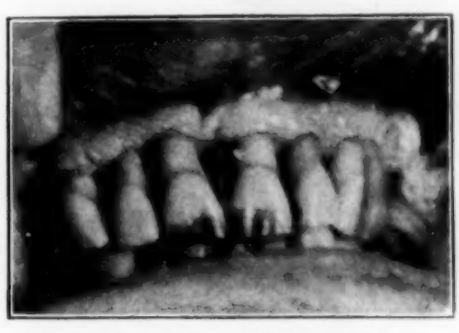

Fig. 6.—Same patient as is shown in Figure 5, six months after operation.

This operation, however, was purposeless in advanced suppurative cases in which the involvement

1. Meeker, L. H.: From the Pathological Laboratory of the New York Post-Graduate Medical School and Hospital.
2. Black, G. V.: A Work on Special Dental Pathology, Chicago, Medico-Dental Publishing Company, 1915, chapter on Treatment of Chronic Suppurative Pericementitis.

of the soft and alveolar tissue was extensive, and recognizing the cause of the failure to be the lack of proper approach to all the involved area, I devised the following operation:

TECHNIC OF OPERATION

The patient is prepared as for all oral surgical operations, performed under procain-epinephrin conductive anesthesia.

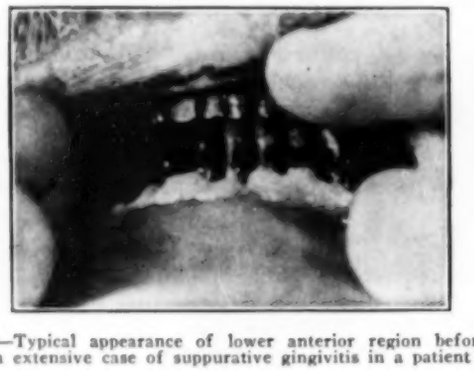

Fig. 7.—Typical appearance of lower anterior region before operation in an extensive case of suppurative gingivitis in a patient aged 55.

The part to be operated on (Fig. 1) is swabbed with tincture of iodin, and a flap is lifted by making two parallel incisions, starting at the cervical free border of the gum, and carrying them apically to the apical region each side of the area over the tooth or teeth involved. The incisions are made so as to penetrate the mucosa and submucosa, and to include the periosteum. This, with the gum tissue overlying it, is lifted with the raspatory, retracted, and held in position by the assistant (Fig. 2). Thus the diseased part is well exposed, and with suitable curets and knives, all the inflamed, infected, granulomatous tissue found, between and surrounding the roots of the teeth, is removed.

Next, with delicate chisels and mallet, the alveolar plate is chiseled away from around the denuded portions of the roots, so as to insure the removal of any and all infected bone covering the roots, which are then well curetted. The rough edges of the remaining alveolar bone covering the roots are well smoothed so as to form an even surface with them (Fig. 3).

The flap is then released, and its inner aspect is inspected for possible adhering inflammatory and granulomatous

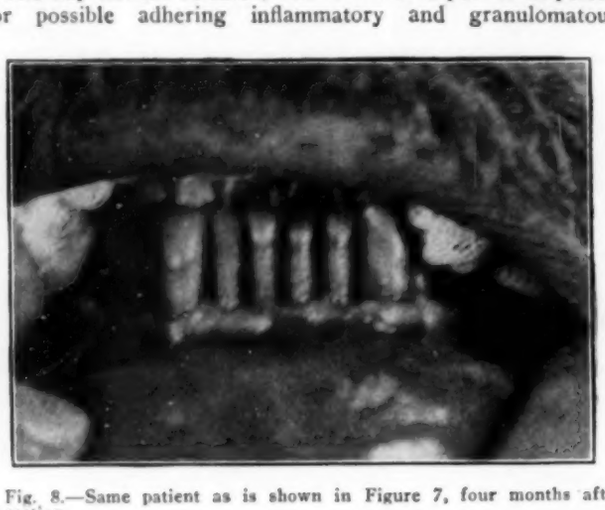

Fig. 8.—Same patient as is shown in Figure 7, four months after operation.

tissue, which is thoroughly curetted away, disturbance of the remaining healthy periosteum being carefully avoided. The parts are washed with physiologic sodium chlorid solution, swabbed with a 50 per cent. solution of the official tincture of iodin, the wound surfaces are freshened up, and the flap is replaced in position and sutured (Fig. 4).

The sutures are taken at each end of the incision, one near the cervical end and the other near the apical end. When the operation is performed over an area covering more than four teeth, it is well to take one or two additional sutures between the teeth, securing the approximation, for instance, of a labial flap to the palatal gingiva. The parts of the free edge of the sutured flap that appear to be necrotic from lack of nutrition, because of the long existing interposed infection, are cut away with sharp scissors, leaving a clean cut which, when healed, presents a well adhering surface, surrounding the root of the tooth. Before the patient is dismissed, the parts are again swabbed with tincture of iodin and covered with a strip of iodoform gauze, which is changed once or twice at intervals of twenty-four hours. The sutures are removed on the fourth or fifth day, and unless the operation was attempted in an extensively necrotic case, in which removal of the tooth or teeth should have been practiced, there will in time be new bone formation around the roots, complete reattachment of the soft tissues, and quite loose teeth will become firm and stay firm (Figs. 5, 6, 7 and 8).

COMMENT

It is needless for me to say that it is advisable that the mouth be placed in as hygienic a condition as possible before the operation, all exgingival irritants, such as salivary calculi or ill fitting fillings, inlays, crowns, etc., being removed from the area to be operated on, and preferably from the entire mouth. In cases in which, for some reason or other, this was not done prior to operation, the patient must be warned

Fig. 9.—Amount of alveolar resorption over upper anterior region in patient on whom operation was performed, shown in Figure 5.

Fig. 10.—Amount of alveolar resorption over lower anterior region in patient on whom operation was performed, shown in Figure 7.

that it ought to be done as soon as the parts have sufficiently recuperated to permit handling them, and the rest of the mouth, for such purposes. This is usually from ten to twelve days after the operation. The patient may then resume the rational care of teeth and gums with tooth-brush and tooth-powder, etc., on the operated area. In the rest of the mouth this need not be interrupted at all, except in rare cases, for one day after operation.

There is usually no discomfort following the operation. At times there is some swelling and pain, after the effect of the procain wears off. The application of an icebag fifteen minutes to the hour, for two or three hours, usually brings prompt relief from pain and reduces the swelling.

All areas of the mouth, without exception, can be operated on as described above. I have extended the operation over as many as six adjoining teeth; but it is advisable when there is a great deal of suppuration in the entire region not to operate at one time over more than three or four teeth, in order to avoid opening up too large an area for septic absorption.

Whenever there are devitalized teeth in the area to be operated on, these must first be thoroughly treated; root canals must be thoroughly, aseptically filled. Apicoectomies may be performed at the same time as the operation for the suppurative peridental

condition. In multirooted teeth this is not always practicable and, therefore, such nonvital teeth, with periapical and peridental pathologic conditions, would better be removed.

As in all other oral surgical operations, the roentgenogram (Figs. 9 and 10) is an indispensable adjunct in diagnosis. It is my experience that when the roentgenogram shows that one side of the root is still supported by investment tissue, the case is a good operative risk. Even in cases in which apparently, from the roentgenogram, the investment tissue is lost almost to around the apical region, the tooth, however, responding to the ethyl chlorid thermal test, the operation was successfully performed in a small number of cases attempted for purposes of experimentation.

ADVANTAGES OF THE METHOD

Full exposure of the entire affected area is obtained, and hence facility for a thorough operation. Once the operation has been correctly performed and the patient dismissed after a few days of observation, the parts formerly harboring infection are totally obliterated, and the patient is able with only reasonable care for cleanliness of the mouth to enjoy health in the parts formerly diseased. Some cases that would be pronounced incurable by the ordinary methods now in vogue for treating so-called pyorrhea alveolaris might be successfully treated by this surgical method.

8 West Fortieth Street.

ABSTRACT OF DISCUSSION

DR. ARTHUR D. BLACK, Chicago: I approve of almost all Dr. Zentler presented, yet I cannot see the advantage of bringing back a flap and making a complicated operation instead of simply cutting away the overlying tissue. Scraping the surface of the root and bringing the soft tissue over it is just what we should not do. If the cementum is dead no soft tissue should be left overlying it. It is very easy to remove all of the detached tissue if the pockets are on the labial, buccal or lingual surfaces of roots, but when the pockets are between the teeth, it is necessary to cut away not only the tissue which is detached from the root, but also some of the soft tissue and the bone on the buccal and lingual sides of the interproximal space, in order to promote cleanliness. In most cases it is necessary to cut away a little of the edge of the bone, because the detachment from the root surface is usually deeper than the crest of the bone over the particular area. No matter what form of treatment has been employed, many operators have been deceived by the fact that the tooth, which may have been quite loose, has become much less so, and they have thought there has been a reattachment of the peridental membrane. The amount of destruction of the peridental membrane and the looseness of the tooth are not necessarily definitely related one to the other. Inflammations involving the peridental tissues cause the fibers to lose tone so they do not hold the tooth tightly in its socket. Following almost any treatment by which the inflammation is reduced, the teeth have less motion within a few days. This does not mean regeneration of tissue, but only that the fibers have regained their tone.

Dr. Moorehead might tell you of the experiments on dogs in which he and Dr. Noyes attempted to cut the peridental membrane away from the cementum. In each case they found, on microscopic examination, that the cementum had not been stripped; that a considerable amount of the soft tissue remained attached to the cementum. When cut in this way the peridental membrane will heal quite as readily as any other soft tissue.

DR. GEORGE EDWARD FELL, Chicago: I have looked on this as a case of infection which must be overcome and in which the mouth has to be placed in such condition that reinfection cannot take place. It is evident that most of our cases of gingivitis can be cured if proper methods are employed and carried out radically.

DR. THOMAS L. GILMER, Chicago: Dr. Zentler has indicated that bone is built up on the sides of the roots of these teeth. I would like to have him state rather definitely, if he will, what is the nature of the union between root and tooth. Is it vital, or if nonvital, is it a union similar to that found in implanted teeth; that is, an absorption of the cementum and a building in of the alveolar process?

DR. TRUMAN W. BROPHY, Chicago: When a part is in an abnormal state, put it to rest. So that the very best thing to do in the treatment of a tooth that is inflamed, as described in this case, would be to put the parts to rest. Band the teeth and fix them so they will not be moving about after the operation is done. In the second place, the tooth root that has been deprived of its pericementum by this suppurative process should be opened and the diseased tissue, together with the end of the root, removed. A few days ago a dentist came with his patient, for whom he removed a first lower molar some weeks before. The patient was still in a great deal of pain and distress. He had removed the tooth, the roots of which had two great abscesses. The tooth came away, but the abscesses remained. After curetting the alveoli and removing the diseased tissue the man was very comfortable in a few days.

Precisely the same condition is present in these cases where it becomes necessary to penetrate the alveolar process and remove diseased tissue together with the end of the root. The surgeon would not be regarded as a very wise man or a very conservative practitioner if he would amputate a leg because his patient had an osteomyelitis. The position is exactly the same regarding the teeth. What the doctor showed us here in the excision of diseased teeth and removal of diseased teeth is correct, and by and by there will be sufficient enlightenment on this question so that so many teeth will not be extracted unwisely.

In regard to the entrance of germs after cutting off the root of the tooth and subsequent treatment, you do not try to sew up the socket or gum tissue after you extract teeth. You allow granulation tissue to fill the alveoli, and after a while you have a well-developed alveolar process. The same is true after excising diseased tissue and the end of the root. The cavity should be left precisely as a tooth socket is left following extraction of a tooth. We all know how these sockets have filled in, leaving a good, round, smooth surface. To amputate the apex of a tooth root is right, but to make a flap and close the cavity by stitches, leaving a place where another abscess may form, should not be done. I would make a funnel-shaped opening, remove the diseased root and diseased tissue, getting it free and clean, and then keep it open until granulations fill the cavity and until the healing is complete. In that way you will not have recurrence of the disease.

DR. FREDERICK B. MOOREHEAD, Chicago: The fundamental underlying question in the type of infection suggested by Dr. Zentler is with the hard tissue and not with the soft tissue. The seat of pathology in these cases is in the hard tissue. The most important question in this whole matter is that of a normal circulation. Where you find a proliferating endarteritis associated with a chronic heart or kidney no amount of local treatment will avail. These infections will not clean up in the absence of a healthy circulation, which, of course, cannot be had unless the blood vessels are normal. Any method, therefore, that has for its object the saving of teeth under these special conditions must be contingent on the general condition of the patient. One may undertake to save teeth when the general conditions are good, while he would remove similar teeth where general conditions were poor. The condition of the circulation and the general reparative power of the patient are paramount factors in guiding us between our efforts to save teeth and their immediate removal. The tooth has no analogue and one cannot, therefore, make a comparison between a tooth and other bony structures of the body. One half of a tooth root may be vital because of its investment in peridental membrane, while the other half may be a foreign body. The portion of the tooth root which has been deprived of its peridental membrane through infection

will act as a foreign body and not be sequestrated. This is not true of any other bone infection in the body. For example, one half of a long bone may be devitalized through infection and be thrown off as a sequestrum. There can be no organic union between a tooth root which has lost its peridental membrane and the surrounding bone or soft tissue. It would seem, therefore, that these elemental fundamental facts must be our guide in undertaking the management of infected teeth.

Dr. E. S. Fuller, Dayton, Ohio: Some years ago, in order to obtain better access for cleaning the root surface of a lower incisor, I made an incision along the axial line of the tooth, cleaned the surface and sutured the gum flaps together. The sutures pulled out and the root surface became exposed. This I thought unfortunate at the time, but now I think it was the best thing which could have happened. During the past three years I have been treating these "pyorrhea pockets" by removing the overlying gum tissue in all cases, excepting those where the pockets were shallow enough to become obliterated by the reduction of the gingival inflammation following the removal of deposits and the cleaning of the root surface. Many cases are seen showing a deep "pyorrhea pocket" on both the mesial and distal proximal surfaces of a tooth—say a bicuspid, for example—the adjoining teeth not being affected. In these cases I frequently extract the diseased tooth rather than resect away the gum tissue from the interproximal space, as a horizontal resection would destroy the attachment of the tooth not involved.

Dr. Arthur Zentler, New York: To understand the character of the union obtained we would have to secure a section embracing all the tissues concerned and submit the whole for histologic examination. It is not easy to obtain human subjects for this. Animal experimentation may be used for the purpose. I believe, however, that we do not have the same conditions in animal as in human mouths. Practical examination shows a union, in operated cases, difficult to penetrate with fine probes. Only by exposing the entire involved area can one eradicate the disease. Simply cutting away the pocket has not proved permanent.

Where I operate at the same time for peridental and periapical infection, I make the incisions as described in my operation. A month after removing the sutures there is no sign left of these incisions, while with the semicircular incisions for apicoectomies cicatrices are present for a long time. One need not fear to suture the flap in either of these operations, provided the operation is done as aseptically as it should be done. I never had an ulterior infection due to suturing. I thought it understood that only healthy tissue is allowed to remain, and in speaking of reattachment I did not mean a reattachment of pericementum, but a reattachment of soft tissues that had been lifted and then replaced carefully, saving the healthy periosteum. Twice I operated in cases previously splinted. The operations were failures. It was due, I believe, to the lack of normal motion. It interferes with circulation and deprives the part of proper nutrition.

It is true that the fundamental pathology is with the hard tissues and not with the soft, and that is precisely why I felt the necessity of lifting a flap and of getting to the hard tissues underneath. That is why I chisel away a strip of the involved alveolar plate as well as curetting the soft involved tissue which lies over it and surrounds the roots. That is why I pronounced it a poor operative risk to operate when all investing tissue is gone, and advise in such cases removal of teeth.

As to the general condition of the patient, I think it is understood that if it cannot be controlled one need not attempt local treatment expecting success. Both must go hand in hand. The local circulation will be improved by the operation if we remove the infected parts. The general circulation must be taken care of by the patient's physician.

Dr. Brophy: Is there not some vitality left in the cementum?

Dr. Zentler: Wherever there is cementum left on a portion of the root that had prior to operating a detachment of the investing tissue, it is an open question in my mind whether this cementum is not able to throw off further cells into newly created healthy surroundings to form some sort of attachment. Where suppuration has intervened I do not believe there will be any live cementum. We get a reattachment of healthy tissue to healthy tissue in approximating them. You need not fear at all to remove some of the healthy tissue if you must do it in order to eradicate all the diseased tissue. The lost healthy tissue will be replaced the same as in any other surgical procedure.

POSSIBILITIES OF FRACTIONAL GASTRIC ANALYSIS *

MARTIN E. REHFUSS, M.D.
PHILADELPHIA

Fractional gastric analysis has for its purpose the determination of the evolution of gastric digestion. The necessity for such extended technic is justified by the fact that gastric digestion is marked by a series of constantly changing phases, so that it may now be definitely stated that an examination of any single phase of the digestive curve gives no information as to what has preceded or what will follow that phase. The most marked changes may occur in comparatively short intervals, so that findings at one period may be doubled or tripled at another period. The main point, however, is the essential fact that gastric digestion is the response of the organ to a definite stimulus, which, in health, evolves in a perfectly methodical and coordinated manner, and in disease evolves with every possible variation. In order, therefore, to interpret gastric disease, we must study the elements governing the response of the organ in health.

NORMAL DIGESTION

From a study of normal digestion with every form of foodstuff, which the entire staff of the chemical department of the Jefferson Medical College was engaged, we arrived at the following conclusions:

Human gastric digestion is divided into a series of recurring cycles which, for the want of better names, we have called the digestive and interdigestive cycles. These succeed each other in health with regularity and represent most perfectly the normal gastric mechanism. The digestive cycle is that portion in response to the ingestion of food of any kind and evolves in a perfectly coordinated manner. There is practically no latent period and there are well marked psychic and chemical phases to secretion. The psychic secretion is very considerable, as we have been able to show, and in health it probably averages 250 c.c., lasting from sixty to eighty minutes and being marked, according to our recent studies, by changes in environment, fatigue, etc. The total acidity averages 97.2 in our series and it is markedly reduced, but does not disappear with atropin administration. The chemical secretion probably commences early but reaches its height later and completes digestion. During this active period, we notice (1) the relaxation of the perisystole and the inauguration of peristalsis, and (2) a change from the resting secretion to a pronounced secretion of much higher acidity. Furthermore, we can detect certain regulating mechanisms such as tryptic or duodenal regurgitation regulating acidity. This cycle is constantly changing as each factor comes into play. It is followed by the interdigestive phase characteristic of normal digestion.

* Read before the Section on Gastro-Enterology and Proctology at the Sixty-Ninth Annual Session of the American Medical Association, Chicago, June, 1918

The stomach is never empty, and there is always physiologically active secretion, but the resting secretion or the residuum seen in the interdigestive phase is very different from the digestive secretion. The quantity averages 50 c.c., the total average acidity being only 30 and the free acid 18, while the presence of bile is much more constant (55 per cent); and tryptic regurgitation is almost constant. Instead of peristalsis, we have perisystole, tonal, and hunger contractions and a relaxed pylorus. It is the study of these phases so characteristic in health and altered by disease that yields us accurate information regarding gastric disease. All the motility changes only translate themselves by a diminution or increase in the interdigestive period.

We are now prepared to say that there is no one form of curve seen in health, but that the curve of the digestive period may be one of three kinds, depending on the type of individual, hypersecretory or hyposecretory. Further study of healthy persons only emphasizes the necessity for retaining these types. In a résumé of 842 complete curves on various foodstuffs with more than 20,000 titrations, we found that 383, or 45 per cent., exceeded 100 total acidity, and on that study embracing three years' work, we are prepared to state that no acid figures occurred in disease which could not be duplicated in health. In other words, we found that 45 per cent. of all responses in health showed so-called hyperacidity, while 42 per cent. of my ulcer series showed the same thing. In other words, there is no greater incidence of high acid figures in ulcer or in any other gastric disease than in health, a fact that raises the extremely important question as to whether an actual demonstrable hyperacidity ever does occur. We must face these facts squarely before we can make progress in this line. They are facts which may be verified and our ideas must be altered to meet them. Furthermore, we are prepared to state that hypersecretion in some form occurs in about 40 per cent of normal persons.

PATHOLOGIC VARIATIONS

In disease, every variation occurs from a total suppression of the gastric secretion to an exaggeration of all the phases. We might classify the elements into (1) those which are a modification of normal total acidity and free acid of the secretion, showing the presence of duodenal regurgitation, and (2) those which are frankly abnormal, such as blood, pus, mucus, certain organic acids, and pathogenic organisms constantly present. The study of normal digestion emphasizes one important point, namely, that at certain phases certain acidities and quantities of secretion are normal and at other phases these same figures are abnormal. For instance, instead of a coordinated curve after an Ewald meal with its height at the one hour and one and one-quarter hour point, we may have a total displacement of the curve, either a markedly exaggerated phase during the first hour or a slow initial phase, followed by pronounced findings at the end of the second hour. Study of pathologic curves shows that every variation of secretion may occur, instead of perfect evolution of digestion. There may be (1) a delay in digestion, (2) an acceleration in digestion, (3) a disturbance in secretory velocity resulting in hyposecretion or hypersecretion, and (4) alteration of digestion by the addition of frankly pathologic products, such as blood, pus and mucus.

We recognize that alterations may come through the systemic circulation (soluble toxins, bacteria) blood dyscrasias, resulting in altered mucosal conditions and altered secretory digestion, or through disturbances in the portal circulation (cirrhosis). These systemic conditions may stimulate or depress secretory activity. Again we know definitely that a lesion elsewhere in the gastro-intestinal tract (gallbladder, appendix) may increase the irritability of the vagus, inducing the secretory manifestations of vagotonia. In chronic gastritis we recognize as operative not merely the inability of the mucosa to form a complete secretion, but also the mechanism of neutralization of the secretion by the mucus. In ulcer we do not look for pathognomonic curves, for we realize that a nonobstructive ulcer gives a very different picture from pyloric stenosis with ulceration. In all forms there is a tendency toward vagotonia, pyloroplasm, hypersecretion, shortening of the interdigestive period, and increase in protein content. In duodenal ulcer, the most characteristic finding is that of positive blood at the phases of tryptic regurgitation. In a large group of duodenal ulcer cases there is present a late hypersecretion, accompanied by periodic regurgitation of duodenal material giving occult blood reaction. Gallbladder disease gives clean digestion and often high acidity without mucus, pus or blood, and when there is pericholecystitis, with adhesions to the duodenum, the adhesions closely resemble stenotic ulcer at the pylorus. However, there is a group of old gallbladder cases associated with duodenitis, in which a low curve with all the findings of true gastric infection may be detected. Appendicitis is most frequently accompanied by clean digestion, with high figures indicative of vagotonia. Cancer has as its characteristics the uniform and constant depression of secretory activity, together with the presence of its specific products, pus, blood, mucus, lactic acid, soluble protein, etc., each of which plays a part in the composition of the curve that is formed. These facts must be borne in mind. Nerve factors, circulatory toxins, the lack of building material, and direct local disease of the mucous membrane may all produce low acid curves, but they produce the curves very differently. The first and second each give a clean subacid curve, and the third is accompanied by elements such as mucus, pus and blood, which give a clue to its source. Let me illustrate: We can see in a certain anemia a low curve without any mucus, blood or pus; it is simply a subacid curve in anemia. The subacid curve in chronic gastritis is punctuated by the periodic secretion of quantities of mucus. In infectious gastritis, there is not merely mucus, but bacteria, pus and blood, and the same is true in case of carcinoma. Pericholecystitis with adhesions to the duodenum may give the same picture as contrasting pyloric ulcer, but blood and increased protein in the latter serve to distinguish it. We know that gallbladder disease, appendicitis, pancreatitis, intestinal adhesions and pelvic disease may all give reflexly vagotonia and the same gastric picture. It is the correlation of all the data which enables us to make the correct interpretation.

Some factors are important. The amino-acid content seems to run parallel to the curve of tryptic regurgitation. Pancreatic ferments or pancreatic regurgitation occurs independently of biliary regurgitation, particularly in the digestion of carbohydrates. With fats, both are likely to regurgitate.

In the analysis of blood, we attach great significance to the position and type of bleeding. Blood synchronous with periods of active tryptic regurgitation is characteristic of duodenal ulcer. Blood throughout the entire digestive phase of subacid cases is seen particularly in cancer and infected gastritis. Blood in the interdigestive period and not in the digestive cycle is likely to be swallowed blood. With pus we must distinguish between extragastric or swallowed pus and intragastric pus or that formed in the gastric wall. The former is always seen in the interdigestive cycle and is diagnostic; the latter is seen in both cycles.

The problems that confront us in the interpretation of gastric work are legion. Fractional analysis only emphasizes how many there are and offers a method for their solution. In the normal subject, we can produce high acid curves with meat, milk, low acid curves with fruit and vegetables, and we can produce an experimental subacidity or achylia with concentrated salt or glucose solution, or we alter the vagus and the sympathetic tonus by drugs and ductless gland preparations that alter the gastric response. Bacterial, chemical, neural, circulatory, and local mucosal disturbances can alter the gastric output, but only actual local organic disease can produce pus, blood, mucus and soluble protein bacteria.

Fractional gastric analysis already has an enviable record. It has emphasized the importance of the digestive and interdigestive cycles. It has enabled us to study the true residuum and to isolate and easily to diagnose swallowed suppurative material from infected processes higher up. It has enabled us to trace exactly the trend of digestion and depict the factors occasioning disturbance. It has opened up new chapters on psychic secretion, automatic regulation of acidity by tryptic regurgitation, and protein curves, and it has emphasized the fact that no one can guess the nature of gastric work but only painstaking technic will reveal all its details.

TOXINS AS DEPRESSANTS

Toxins of a bacterial nature usually act as depressants to the secretion. There are certain infections in the nose and throat, however, which unquestionably induce increased vagus tone and result in an increased secretion. In the analysis of the gastric curve, many points must be taken into consideration. Anomalies in the gastric secretion may be simply a perversion in secretory output but without the addition of evidence of local disease. For instance, gallbladder, appendiceal, intestinal, pancreatic and nervous conditions may give rise to well marked changes in the curve, either a prolongation of digestion, late hypersecretion, or other changes. But as soon as we have the addition of mucus, pus, blood, or bacteria, we are probably dealing with a pathologic process in the stomach itself.

Take, for instance, the question of delayed digestion, in which evolves a low, slow curve that is clearly pathologic. This curve is encountered in cases of chronic gastritis, late pulmonary tuberculosis, a group of anemias, chronic parenchymatitis, nephritis, a small group of old ulcers, and finally in a very large group of gastric cancer. In each case the mechanism is different, although in all there is the underlying disturbance in the mucous membrane, possibly primary in certain forms of gastritis and carcinoma, and clearly secondary in anemias, nephritis, hepatic disorders, cirrhosis and tuberculosis. In the cancer group, we see a disproportionate reduction in free acid and the presence of pus, blood, mucus, lactic acid, etc. In chronic gastritis we see simply a disproportionate amount of mucus. In some of the anemias and in nephritis there may be no increase in mucus, and free acid runs proportionate or parallel to total acidity. A cure may follow local treatment, it may follow treatment directed to the heart or kidneys, or again, curiously enough, these secretory delays may suddenly clear up after removal of a focal infection in the teeth, the sinuses, the tonsils, etc. I have case records in which the entire response was altered after such procedure. The whole problem is so complex that painstaking research alone will solve it.

We have been able to show that the delayed curve of acidity may come about (1) through a delayed elaboration of secretion on the part of the mucous membrane, (2) through a strong duodenal regurgitation neutralizing an apparently normal secretory output, and (3) through the neutralization of the secretion by pathologic products, such as mucus, pus and blood. The first form is accompanied by no evidence of either tryptic regurgitation, or mucus, pus and blood, and may be due to anemias or to circulating toxins, or may be the result of disease elsewhere altering the circulation of the nervous supply. The second form is shown by the evidence of regurgitation in laboratory study. The third form belongs to the group of true gastric infections and cancer. All of them are susceptible to careful analysis.

CONCLUSIONS

1. Fractional gastric analysis alone can reveal the evolution of gastric digestion. Gastric digestion, whether normal or pathologic, consists of a series of constantly changing phases. Certain phases are normal, certain are obviously pathologic.

2. Normal gastric physiology consists in a rhythmic series of cycles in which we may differentiate the digestive and the interdigestive periods. In health, they succeed each other regularly; in disease, their sequence is seriously interfered with.

3. The digestive cycle is the response of the stomach to a definite stimulus. The response is partly psychic and partly chemical, but in its essential characteristics, it differs from the interdigestive phase.

4. There is always a physiologically active secretion in the stomach but the characteristics of the two periods are very different. The digestive secretion persisting into the interdigestive period is pathologic.

5. Our studies of healthy men indicate that there is no acidity in disease which cannot be encountered in health, and the diagnostic value of high acidity must be very carefully worked out. Forty-five per cent. of more than 800 cases (normal) gave a total acidity of 100 in excess. Normally, we point out three different secretory types.

6. Pathologically every possible variation in secretory output occurs. At present it seems that there are many possibilities in the analysis of each variety of curve. It is at this point that circumstantial evidence by the study of the protein curve, pus, blood, mucus, bacteria and tryptic regurgitation may throw light on the subject. In every case the extragastric as well as the gastric causes must be reviewed.

7. The gastric response may be shortened, delayed or exaggerated. It may be accompanied by the most

marked variations in secretory and acid concentration output. It may be altered by the addition of pus, blood, mucus and bacteria in every possible way, and these variations may occur only at certain portions of the curve, emphasizing the necessity for complete examination.

8. The investigation of psychic secretion, tryptic and biliary regurgitation, hypersecretion, protein concentration and secretory velocity, and of the evidence of pathologic material is full of promise.

ABSTRACT OF DISCUSSION

DR. A. F. R. ANDERSON, Brooklyn: A study of findings on fractional examination of gastric contents in about 800 patients leads to the following conclusions: The only curve of acidity which is of itself of absolute value in diagnosis is that found in achylia gastrica, a straight base line, representing free hydrochloric acid, running along the zero line, and a slightly varying curve of total acidity. The achylia of malignancy is quite often found to be associated with a high total acidity. The reflex type of curve is also of considerable value as indicating an inflammatory condition somewhere in the abdomen or pelvis, causing a reflex manifestation in the stomach. A finding which we consider typical of duodenal ulcer is the occurrence of blood and bile coincidently during the fractional examination. Trauma from the tip of the tube catching in the pylorus and being pulled on must be excluded, but sufficient trauma to cause bleeding is exceedingly rare. Pyloric obstruction will show the normal overnight residue and the usual findings of carcinoma or of ulcer. After gastro-enterostomy for ulcer, bile is usually present in considerable amount, and when blood is also present it may mean persistence of the original ulcer, or the presence of a jejunal ulcer. Gastric motility can be determined more accurately by the fractional method than by usual routine roentgen-ray examination. Cases of gastroptosis showing a normal or even a slightly increased motility by the test meal examination often show much residue six hours after the usual sized barium meal. When, subsequently, a smaller barium meal is given, normal emptying may occur.

DR. WILLIAM VAN VALZAH HAYES, New York: The practical question that comes up is, How can we, as gastro-enterologists, employ this sort of technic in the ordinary case? There are many pros and cons on the subject, and up to date I have not used the method very frequently. In the ordinary case, in addition to a careful history and careful physical examination, examination of the stool, etc., we want to find out what the stomach does in the early and in the late stages of digestion. Are we going to put in a tube which will make the patient uncomfortable, which will cause a continuous flow of mucus and other secretions, and more or less obscure certain phases of the gastric activity, or can we, with less trouble to the patient and to ourselves, get the data we need? I believe that in the average case we can get these data by simply giving the test breakfast and taking it out an hour later. Then the following day give a duration test, i. e., two soft boiled eggs, a roll and a glass of water. Three and a half hours later use the tube to see whether the stomach has emptied itself as it should have, or whether there remains a considerable amount of gastric contents, with high acidity and possibly regurgitated blood or bile from the duodenum. Diagnosis is nearly always possible in this way.

DR. FRANK SMITHIES, Chicago: This is a practical method in the diagnosis and treatment of gastro-intestinal ailments. It seems quite impossible that apart from the diagnostic significance of these curves, an individual should fail to appreciate the importance that some of these curves carry with respect to treatment. One of the main points brought up during the past few years is the differentiation of gastric and duodenal ulcer. These curves enable us to differentiate quite easily the postpyloric from pyloric or antral ulcer. It seems that frequently it would be almost impossible in any other way to differentiate this class of case. Regarding the indications for treatment: There is no rule of thumb method of treatment of ulcer of the stomach or duodenum. There must be intense individualization of treatment. The treatment and the cure do not depend on anomalies of gastric secretion. Other factors come into play. The causes of ulcer indicate that in treatment we must first look to the individual factors in the production of ulcer. Afterward, if we give any medication, we must give it according to our knowledge of what the patient's stomach is doing. In many cases a great deal of medication is not needed. The work of Crohn bears out some of Dr. Rehfuss' observations, namely, that in the giving of alkali we very often cause more harm than good. We simply defeat nature in its attempt to secure in the stomach a restoration to normal.

With regard to the mucus cases Dr. Rehfuss mentioned: In these cases, where we have early secretion by the fractional method, within the first half hour or hour, and then have an accumulation, of a great deal of mucus, we are simply dealing with an instance where the gastric glands are easily fatigued, and the condition represents a form of gastric fatigue, with mucoid secretion instead of the specific secretion of that gland. We have seen it in patients who have been given great quantities of alkali. It is apparent from a knowledge of gastric physiology that what alkali does is simply to urge the stomach first of all to restore the natural reaction of the stomach contents, namely, faintly or definitely acid. To do this it must overcome a foreign body, namely, the excess alkali. It does this by first producing a great deal of acid, then there follows physiologic fatigue, namely, an excessive secretion of mucus, which has to be washed out. If more alkali is given, in the end, the stomach does not produce acids. In periods varying from six to twelve days there is no acid secretion whatever. The glands are putting out a great quantity of mucus. This indicates mucoid degeneration, or physiologic fatigue of the cell.

DR. MARTIN E. REHFUSS, Philadelphia: Regarding Dr. Hayes' suggestion that this seems to be a little too extensive a procedure, a great majority of the men I have met do not think it is at all extensive. I do practically nothing else. My assistants are trained. I do not pass the stomach tube more than a few times a week. You can train nurses to do every little detail covering this work. It is a question of organization to do this work. It is absolutely impossible, by simple examination, to predict anything regarding the stomach. I have seen any number of people who were told that they had a normal stomach after a single examination.

Dr. Smithies mentioned glandular fatigue. We found that in the normal, healthy individual we can give a meal and develop a curve, and give a meal immediately after, developing the same curve, showing there was no glandular fatigue. However, we took students around the examination period, and not only found that we could produce physiologic fatigue, but also a form of nervous fatigue. We found a man who could not coagulate milk, and when he came back after a vacation the milk was beautifully curded, which shows the effect of giving it to him in that way.

The Asset of Good Health.—I am heartily in favor of this measure [bill for an addition to the Hygienic Laboratory], because it helps in the preservation of health. For years and years the medical men of the world have been trying to impress on the people this fact, that good health is the most valuable asset we possess. It is often said on the floor of this House that this war, as horrible as it is, will teach the American people many valuable lessons. And there is no doubt in my mind but that one of the most valuable lessons that will be taught in this war will be the importance of preventing disease. Today we understand as we never understood before that it it necessary not only to preserve the health of our boys on the firing line, but it is also equally necessary to preserve the health of the people at home, who are united and working earnestly to produce the necessities for these boys on the firing line. I hope that the American people especially will never forget this lesson, and that from now on they will be willing to appropriate the money necessary, so that medical men can experiment and carry on the work that is necessary in order to prevent disease, and not wait until people are sick and then spend ten times more to be cured.—Mr. Lazaro, *Congressional Record*, Oct. 2, 1918, p. 11944.

RENAL COMPLICATIONS OF PREGNANCY FROM THE STANDPOINT OF THE UROLOGIST *

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The important rôle played by the kidneys during pregnancy has long been a matter of serious thought. Recent investigations of metabolism and kidney function have broadened the general knowledge of this subject, but very little has been added by the urologist. The more careful study of pregnancy by the urologist in association with the obstetrician should lead to a diminution in the incidence of renal complications and a more rapid recovery, with less serious sequelae when lesions are found to exist.

The patients whom I have seen during pregnancy have all presented well developed complications, only then recognized. In these cases, one fact has appealed to me, namely, that too little attention is given to the individual woman when she first presents herself to the obstetrician. This fact holds good for private patients, who usually come for examination early in pregnancy, as well as for hospital patients, who present themselves late in term or when in labor. Less may be accomplished with the latter than with the former class. The environment, habits of life regarding exercise, eating, drinking, and the condition of the gastro-intestinal tract all receive little consideration. A complete examination, including the mouth, teeth, tonsils, accessory sinuses, chest and abdomen; careful palpation of the kidney and other viscera, coming lastly to the pelvic organs, should be made but seldom has been made. Often there has been a single analysis of a voided specimen. A chemical and bacteriologic examination of a catheterized specimen of urine, and, if the patient presents any urinary symptoms, a complete urologic examination should be but has not been made. The taking of pelvic measurements, the palpation of the uterus and adnexa, the examination of a voided specimen, and a few words of advice, will not go far toward anticipating and preventing renal complications of pregnancy.

The renal function is such an important factor during pregnancy that it is right to look on the pregnant woman in one sense as a urologic case. This is true to the extent of warding off complications by advice as to the proper management of the case, and actual participation in and continued observation of those presenting renal complications.

ETIOLOGY

Why are the kidneys particularly susceptible to lesions during pregnancy?

1. Being organs of elimination, they are called on to eliminate the toxins of the fetus as well as of the mother.

2. The skin is less active than normal, rendering little assistance.

3. The diminished activity of the woman leads to less activity in the organs of metabolism, poor digestion and sluggishness of the bowels, thus increasing the amount of toxic material thrown on the kidneys to eliminate.

4. The increase of toxic products passing through the kidney causes kidney irritation, which leads to congestion, thus producing an important predisposing factor to infections.

5. The lowered resistance of the patient allows focal infections to become more active.

6. Coexistent with the foregoing, more bacteria are thrown into the blood stream, and the kidneys, already congested, are fertile soil for infection.

7. Intra-abdominal pressure mechanically interferes with the normal function of the abdominal viscera.

8. When a preexisting kidney lesion is added, such as a renal or ureteral anomaly, renal tumor, or malposition of the kidneys, a chronic infection, chronic nephritis, or a calculus, as well as ureteral lesion interfering with drainage, the urologic aspect of the case becomes most important. Should not the kidneys be relieved of the load so far as possible? How may this be accomplished without a complete examination of the patient and attention to all details of bodily activity?

Recent investigations have given evidence to show that a large percentage of renal infections are hematogenous in origin. A case recently observed clearly demonstrated this point. The woman, seen during her eighth month of pregnancy, was septic. I was asked to see her because of the diminished urinary output, and the presence of large numbers of streptococci and colon bacilli in the urine. Blood cultures showed the same organisms. She died of general sepsis. At necropsy, conducted by Dr. Losee, of the Lying-In Hospital, multiple miliary abscesses were found in the substance of each kidney, sections of which showed the same organisms, while the kidney pelves presented no lesions.

While the transmission of infection from the colon or the bladder to the kidney by lymphatic extension or directly to the ureter from a diseased appendix or a broad ligament infiltration or along the ureteral mucosa when there is a deficient vesico-ureteral valve, is possible and probably does occur, these cases are rare.

The most important element, next to the supply of bacteria to the kidney, is a lowered kidney resistance from the causes already enumerated, or interference with kidney drainage. Pressure on the ureter from the fetus has been given as an important factor in this connection. The ureters, particularly the right, have been found dilated and filled with urine in about two thirds of the gravidae coming to necropsy. This has been attributed to torsion, stretching or kinking of the ureters due to the enlargement and dislocation of the pelvic organs, but not to compression, since the specific gravity of the pregnant uterus is said to be equal to that of the intestinal mass. The pressure in the pelvis of the kidney is only 10 mm. of mercury, so that slight causes may lead to the stopping of the flow of the urine in the ureter.

Ahlberg found bacteriuria in 15 per cent. of pregnant women. Neibel found the urine sterile in only 25 per cent. of cases, demonstrating the presence of streptococci, staphylococci, and colon bacilli. Bacteriologic examination of the urine of all pregnant women should be made. The establishing of the relationship of bacteriuria to eclampsia and nephritis would be valuable.

* Read before the Section on Genito-Urinary Diseases at the Sixty-Ninth Annual Session of the American Medical Association, Chicago, June, 1918.

* Because of lack of space, this article is abbreviated in THE JOURNAL by omission of the bibliography. This will appear in the Transactions of the section and in the author's reprints.

The majority of patients whom I have seen have presented active symptoms due to infection. If there was drainage, these symptoms were vesical (frequency, burning, painful urination); if drainage was absent, the symptoms were pain in the flank, tenderness in the costovertebral angle on one or both sides, and often tenderness in front, and in some cases the kidney could be palpated. When drainage is poor, the patient has an elevation of temperature, which is often associated with a slow pulse.

EXAMINATION AND RESULTS

Cystoscopic examination of a pregnant woman is seldom difficult. The patient is usually seen between the fourth month and term. The bladder is flattened from above downward, on account of pressure on the fundus from the enlarged uterus. Enough fluid must be injected into the bladder to elevate the uterus from the trigon, when with a close-vision cystoscope with the beak well depressed, the ureteral orifices are easily distinguished and catheterized. When the ureteral catheter is passed, a moderate amount of pressure may be necessary to advance the catheter on one or both sides. In some cases there is a tendency to an obstruction, and whether due to torsion or kinking of the ureter, or pressure on the ureter, it is found more often on the right than on the left side, and between 10 and 20 cm. from the bladder. When the catheter enters the renal pelvis, there is often a rapid flow of cloudy urine or thick pus, which diminishes in rapidity until it comes down to normal excretion. Complete ureteral obstructions were encountered in the series examined, and demonstrated to be due to calculus, kink, and pressure on the ureter from without. Roentgenograms were taken with catheters in position in certain cases, and in the complete obstructions a thorium injection was made.

In 90 per cent. of the cases observed, the infection was due to the colon bacillus. The bacilli were found on both sides in 75 per cent. of the cases, but in all the infection was more severe on one side than on the other. The kidney function was diminished in all.

A routine pyelo-ureterogram has not been justifiable, owing to the condition of the patients.

It has been my practice to do as little manipulating as possible in these cases. In the infections the patients are often acutely ill, and no more should be done than is necessary to give immediate relief of the symptoms. This means establishing drainage.

UNUSUAL CONDITIONS, WITH ILLUSTRATIONS

Several unusual conditions were encountered, and I shall enumerate them briefly.

One patient, a woman aged 26, presented a unilateral chyluria, with no demonstrable lesion. Aside from the presence of a large amount of chyle in the urine from the left kidney, the examination and pyelograms were negative. This condition had been present when she first menstruated and during the puerperium with her two previous children, but had appeared at no other time.

A woman four months pregnant developed pain in the right upper quadrant, and a firm, irregular mass appeared. A catheter was passed into the right renal pelvis, resulting in a rapid discharge of clear urine, which was free from infection. A pyelogram showed a hydronephrosis. An abdominal exploration revealed a large fibroid attached to the right side of the fundus of the gravid uterus, which pressed on the right ureter. The fibroid was removed, with relief of symptoms, and the patient went to term.

Urgent bladder symptoms during the fourth month of pregnancy were found to be due to a pyelonephritis occurring in a pelvic kidney, in a woman who had previously complained of no urinary symptoms.

Profuse hematuria, localized as unilateral, occurring in a woman five months pregnant, was not relieved by pelvic lavage, but ceased two weeks after the uterus was emptied. Another case of hematuria, the source of bleeding being the left kidney, came under observation when the patient was two months pregnant. Complete urologic examination showed deficient function of this kidney, but no evidence of infection. The patient had a positive Wassermann reaction. The bleeding ceased after the administration of arsphenamin.

Bilateral polycystic kidneys were demonstrated in a patient five months pregnant, who had not previously noticed any urinary or abdominal discomfort.

A ureteral calculus causing ureteral obstruction was found in two cases during pregnancy. In the one, the calculus was passed following cystoscopic manipulation. In the other the calculus was removed, the patient going on to term.

Sharp angulation at the ureteropelvic junction was demonstrated by pyelo-ureterogram in three cases in which there was a complete blocking of the ureter.

I have drained a perinephritic abscess in two patients immediately following delivery, the infection of the kidney arising during pregnancy, but not being recognized until after confinement.

Pyonephrosis, with an acute infection occurring during pregnancy, and renal calculi have been noted in two cases, in both of which the patients were temporarily relieved by pelvic lavage and were carried to term.

More than 90 per cent. of the cases observed have been acute infections, most marked on one side, occurring during the last three months of pregnancy. The patients were suffering from absorption, high temperature, pain in the side, and urinary symptoms. These patients were all catheterized, given pelvic lavage, and in many the ureteral catheters, one or both, were retained from twenty-four to forty-eight hours. All were relieved and went on to term.

A typical case of this group was a woman, aged 25, with a history of good health until this, her first pregnancy. During the first two months she suffered from severe nausea and vomiting, resulting in irregularity of her diet. She remained in bed most of the time, became constipated, and during the third month had a stool only after taking a cathartic, often going three days without an evacuation of the bowels. During the fourth month she developed frequent and burning urination. When I saw her she had had a chill, followed by fever and slight pain in the back, two days later, tenderness in the loin, and more urgent urinary symptoms. Cystoscopic examination showed the bladder intensely congested. There was retention of urine in the left renal pelvis. This urine contained pus and colon bacilli. The kidney function was diminished. The right kidney showed a milder infection. Pelvic lavage, with retention catheters in the kidneys for thirty-six hours, resulted in a drop of temperature from 103 F. to normal, and complete relief of symptoms. The knee-chest position for the relief of pressure for twenty minutes to an hour a day, a second pelvic lavage at the end of three weeks, and careful attention to the gastro-intestinal tract, gave lasting relief, and the patient went to full term. Six months after confinement specimens taken from each kidney showed only a diminished function of the left kidney. This woman became pregnant a year later. Most careful attention was given to diet, exercise and bowels from the outset. Once

during the third month, slight urinary symptoms appeared, and lavage of the kidney pelvis was given at once, with complete relief. The patient went through this pregnancy with no further complications.

In hospital service, patients often enter the hospital in labor. They seem sicker than normal, and not until after delivery is a renal infection discovered.

Not only is it important for the immediate welfare of the pregnant woman to give her all the relief possible when a renal infection exists, but for her future health. If one takes a complete history of a woman applying for relief of urinary symptoms, very often is it found that the active symptoms date from pregnancy. The possibility of some earlier lesion even from childhood, such as nephritis complicating an infectious disease, or a renal injury, should be ascertained, the existence of which may have rendered the kidney more vulnerable during pregnancy.

The possibility of preexisting but symptomless disease in the kidney, or of actual lesions as enumerated, giving lowered resistance, may play an important rôle in predisposing to kidney lesions during pregnancy.

Movable kidneys due to poor drainage are particularly prone to infection. A kidney previously normal when congested from the irritation of toxic products from the intestinal tract, and of large numbers of bacteria, develops a pyelonephritis which may or may not be recognized during pregnancy, but which leaves the organ permanently damaged to a greater or less degree, leading to future trouble. Therefore, not only should lesions be recognized and immediate relief be given to carry the woman through pregnancy, but after the pregnancy she should be observed until the maximum amount of permanent benefit has been derived by palliative or radical measures. Unquestionably many serious kidney lesions of later life will thus be avoided. Once the seat of an infection, a kidney is always more vulnerable. Few women who have gone through a pregnancy have the same general tone as before. Relaxed abdominal muscles, impaired perineal support, greater tendency to constipation from the foregoing causes, and a more sedentary life predispose to future renal infections, and many of the cases of frequency of urination seen in women later on in life are but relapses of the old infection or reinfection in kidneys once damaged during pregnancy. How easy it is for a bladder, possibly with weakened support, emptying poorly or subject to pressure from pelvic displacements also secondary to pregnancy, to become infected from the urine from such kidneys, and to cause distressing symptoms for years!

TREATMENT

The treatment resolves itself, first, into prophylaxis. Such infections may be prevented by impressing on the obstetrician and general practitioner the important rôle of the kidneys during pregnancy. He should go into the history of his patient more carefully, the catheterized urine should be examined bacteriologically as well as chemically, and any variation from a normal condition should be an indication for a complete urologic examination.

Closer attention should be given to the metabolism of the patient, especially in the intestinal tract, thus eliminating as fast as possible the amount of toxic products of intestinal putrefaction thrown on the kidneys, not by the administration of cathartics, but by exercise, diet, and plenty of fluids. This also means diminution in the number of bacteria passing through the kidneys. In this connection, the importance of eliminating focal infections, whether oral, nasal or otherwise, cannot be overestimated.

When a pathologic condition in the urinary tract has been found which might predispose to a kidney infection, it should be eliminated early in pregnancy if possible. Patients as a rule withstand treatment and operation during the early months of gestation with remarkably little reaction. Whether or not a woman should attempt to go through a pregnancy with a renal lesion present, thus subjecting the kidneys to the added strain and possibly infection, is a question to be decided in each case.

Renal anomalies, tumors, calculi, and infections come under this consideration, and some surgical measure—nephrectomy or nephrotomy—may be advisable at once.

In the presence of such lesions, relief of the kidney to the extent of diminishing its load is certainly indicated, and consists of the most careful attention to details.

When a kidney infection is already present, the indications are to give relief from the toxemia by establishing drainage, and to cut off the supply of toxins and bacteria. This means kidney drainage with the ureteral catheter, retention of the catheter if necessary, lavage of the kidney pelvis, free fluids by mouth, colonic irrigation, and lastly, urinary antiseptics. If relief is not obtained, termination of the pregnancy is to be considered, and, lastly, some operative precedure, such as drainage of the kidney or nephrectomy, if one kidney is the source and relief cannot otherwise be obtained. Following immediate relief, the patient must have the closest attention during the remainder of the pregnancy to prevent a recurrence of the acute infection. A shifting of the intra-abdominal pressure gained from the knee-chest position is valuable and all other measures noted in prophylaxis are important.

When a patient has passed through the labor, she should be treated as a urologic patient until all damage has been repaired to its fullest extent by treatment or operative procedures. The possibility of future trouble must always be considered and guarded against.

ABSTRACT OF DISCUSSION

Dr. Herman L. Kretschmer, Chicago: My experience has been that these patients come to us very late. The general practitioners who carry these women through pregnancy do not seem to realize the importance of watching their condition carefully and of making routine examinations of the urine. Generally, when we are consulted, the patient gives a history of bladder distress extending over varying periods of time. They are often treated for retained placenta, sepsis, malaria, appendicitis, etc., and the real cause of the symptoms goes unrecognized. Finally, the urologist is called late in the course of the patient's illness, whereas he should have been called in at an earlier stage. In many of the cases I have made a special effort to elicit a history of previous bladder distress. I think that many of these cases are a "lighting up," by reason of the pregnancy, of conditions from which the patient was suffering before becoming pregnant. I found that some of them had had pyelitis in infancy. Several patients have referred back to their school days when they would tell that they had had bladder distress. In several cases patients had indefinite histories; several had been subjected to the removal of the appendix, with or without temporary relief; so that often the real cause of the trouble is not recognized.

I was interested in the effect of pregnancy on pyelitis in patients whom I cured, and who became pregnant again. I have had occasion to see two or three of these women. When

discharged they were cured, as their urines were sterile and free of pus, and they did not develop pyelitis in subsequent pregnancies. The importance of examinations before, during and after pregnancy cannot be emphasized too much.

In approximately 90 per cent. of cases the infection was due to the colon bacillus. In one or two a pure culture of streptococci was obtained. All patients had residual urine, in the kidney or kidneys.

One point deserves special emphasis, and that is the question of treatment. I agree entirely with Dr. Bugbee about prophylactic treatment and about carrying these patients through till they are well. Often they go to the family doctor or to the obstetrician, who knows but one treatment, and that is to empty the uterus, because following this procedure the acute symptoms disappear. These patients are not cured because there is nothing done to cure the infection. At least half of my cases were cases seen in consultation with the obstetrician, and in each and every instance the obstetrician advised immediate emptying of the uterus; and in each instance this procedure was not carried out and the patient went on to full term without any operation.

DR. JOHN R. CAULK, St. Louis: In every locality we seem to have the same trouble with the obstetrician and the general practitioners. We must train them to realize the importance of renal complications during pregnancy, and particularly infections; and teach them to protect their patients by investigation before and during pregnancy in order to avoid focal infections of various sorts. Most of these women probably have had pyelitis before. They may have had an infected kidney or renal retention. Retention more than anything else that predisposes to these infections during pregnancy, and the rapidity of cure depends a great deal on the duration and the extent of the retention, and how much the musculature of the pelvis has been overstretched, just the same as in bladder retention. It is surprising how quickly a kidney which has been overdistended for some time will rapidly come down to its normal capacity, and the temperature and toxic processes will abate. We must get the obstetrician acquainted with the fact that he must quit ascribing everything to pyelitis and giving hexamethylenamin. We have not appreciated the value of ureter catheter drainage. It is not only applicable to pregnancy, but can be applied to all acute renal retentions. In cases with pure pus exuding from the ureteral orifices, with no function on that side, and the other side functioning normally, one unblocking will at times effect a cure. It is surprising that the kidney does not require surgery, resuming its function within a week or ten days. A kidney with retention which shows a very slow phenolsulphonephthalein output, which looks as though it should be attacked surgically, will often come back to normal usefulness by catheter drainage. There is no question that we cannot only save the kidney but the individual, and we will not have the operations or abortions we are having right along.

DR. V. D. LESPINASSE, Chicago: This discussion seems to have drifted more into a discussion of infections of the kidney that occur during pregnancy and are exacerbated by the presence of pregnancy. I have been much interested in the kidney of pregnancy from the standpoint of true renal complications without infection. We were enabled to reproduce this non-infected kidney of pregnancy experimentally by making a symbiosis between a small individual representing the baby and a large individual representing the mother, completely joining their circulations; and in that way we have obtained some very beautiful specimens identical with eclamptic organs. The organs (kidney, liver and spleen) show a cloudy swelling, focal hemorrhages and complete degeneration. When you do this with individuals not of the same blood group you have a much greater effect, a much larger hemorrhage. These changes are not limited to the kidney only, but involve the liver and the spleen—a most intense poisoning. This irritating substance, characteristic of pregnancy, is the material that causes all this lighting up of old and the development of new infections. The kidney, spleen and liver have been compromised, their blood supply is interfered with, and if a colon bacillus is in the neighborhood it localizes in the kidney and produces a so-called pyelitis.

DR. A. E. GOLDSTEIN, Baltimore: Ever since Dr. Caulk's paper two years ago on these cases of pyelitis in pregnancy I have been interested from the standpoint of renal insufficiency, particularly as to the blood urea. In pyelitis there is retention and also decreased function. By the use of ureteral catheters, allowing them to remain in place twenty-four to forty-eight hours, the blood urea decreases and the phenolsulphonephthalein increases, thereby avoiding forced deliveries in many cases of pyelitis of pregnancy.

DR. HENRY G. BUGBEE, New York: I had a patient who gave a history that in thirteen days she had not passed any urine. Three weeks previous to the suppressing she had had a cauterization of the cervix for carcinoma. I found on examination that there was no urine in the bladder and that both ureters were obstructed about 2 c.c. from the vesical openings. We operated on this woman and found that a cicatrix had formed which involved both ureters, closing them off completely. Each ureter was about the size of one's thumb. We cut off each ureter at the lower end as close to the cicatrix as possible, and then implanted it into the top of the bladder. Her kidneys functionated at once and have continued to ever since.

IMPORTANCE OF BEDSIDE INSTRUCTION IN THE TEACHING OF THERAPEUTICS

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There is, I believe, a gap between the instruction given in materia medica, pharmacology and therapeutics on the one hand, and the requirements of medical practice on the other, which, were it filled, would assist in making therapeutics even more valuable than at present. Let me recall the detailed instruction given to students in the comparatively few things employed in the surgical treatment of patients. An example is afforded by the instruction in the use of splints and bandages. The students are not only taught in a general way how and why these are used, but apply them repeatedly, the work being done in small sections. Students should be trained in a similar manner in the medical treatment of patients. The power in the hands of the physician does not display itself so dramatically as that in the hands of the surgeon, but it is no less essential, and opportunities for its use are more frequent.

Not only must a subject so unusually complex as therapeutics be presented in lectures and recitations, but also more opportunity should be afforded for bedside instruction, given by a physician who has had a training in pharmacology, as well as a clinical experience. To illustrate, let me describe some exercises of the character I would advocate, which I gave about thirty years ago. The students were taken into the wards in small sections, not exceeding eight in number, and standing about the patient's bed were given the diagnosis, together with a brief outline of the case. They were then told to consider that the patient had come to them for treatment, and, after any questions which they wished to ask had been answered, were required to write, on blocks of paper which had been distributed to the section, what they would do if the patient were their own. This was not limited to the use of remedies, but included directions as to diet, occupation, habits of life, etc. These outlines were handed to the instructor, and as some were ready sooner than others, there was sufficient time for him to

look over each paper without delaying the exercise. The papers usually fell into three groups: one in which the students had done well; another in which they had outlined a treatment which was incomplete; and a third in which they had made serious mistakes, for example, in choosing the wrong remedies, or in giving them in an amount or in a way which would fail to be of any value, or in such a way or such an amount that harm might be done. Comments were made freely by the instructor, so that all received the benefit of what was good, as well as the warning involved in the mistakes made. As names were not mentioned, the comments were impersonal and could thus be made more emphatic. A most convincing evidence of the need of instruction of this nature was afforded by the character of many of the answers written at these exercises. After the students had done their best, and had been told why some of their directions should not be followed, they had an opportunity to see how the physician met the situation. At subsequent visits the results of treatment could be noted.

In these exercises the instructor, when prescribing a laxative, a hypnotic or an analgesic, for example, was able to recall briefly to the minds of the students the important members of the group from which it was chosen, and give the reasons for his choice, why it was especially adapted to the patient's condition, and the precautions which should be taken to promote success and avoid harm. In order to emphasize still further the clinical side, the final examination in therapeutics included not only the usual written examination, but also an oral examination, which gave a better opportunity to bring out the proficiency of the students on this side of the subject.

In connection with the exercises described above, but in larger sections, the students had two or three others in which they were shown how a hot-air bath should be given, methods of administering remedies, of feeding, etc., and also some demonstrations by trained nurses. A young practitioner recently confided to me his perplexity when, as a house officer, he was told to give a patient a hot-air bath; he had never seen it done and did not know how to go about it. For a medical student to have an opportunity to see such demonstrations once, with explanations, is sufficient.

This method of instruction, namely, requiring each student of a small group at the bedside to state what he considers the proper treatment for the patient, under the oversight of an experienced physician who has had a training in pharmacology, is not used in our medical schools, so far as I can judge from the catalogues of more than twenty of our best schools. Incidentally, I noted that in more than one half of these there was no professor of therapeutics. This subject is one of the most important in the course, and every medical school should have, I believe, such a professor, who should be in touch with all instruction concerning medical treatment in the school.

Let me quote here a sentence from a statement made about thirty years ago, as a result of my experience with this method, a copy of which I came across recently:

> I believe that bedside teaching of therapeutics is of the first importance to students, to practitioners and to the community, that no other method is so well adapted to show students how the obstacles in the way of giving relief to patients are to be overcome, or to have the practitioner know how to distinguish between what is of service to the patient and what is harmful, to have him appreciate the dangers of new or absurd methods of treatment, and understand how to carry out safely and advantageously the many means of relief which are at our command, and of which it is sometimes very culpable for the practitioner to be ignorant.

This method gives the student an opportunity to realize the limitations of treatment, to appreciate the need of judgment and courage to use a powerful remedy in such amounts and in such a way as the occasion demands, and to gain a sense of values, that is, to see the problem of treatment in perspective, a difficult thing for many minds to acquire in any subject. It also offers another opportunity for joining the experimental method which prevails in the laboratories of chemistry, physiology and pharmacology, with the observational method for which the clinic affords such a wide scope, and leads the student to form habits of thought which make him a better practitioner and more truly a professional man.

In didactic teaching it is impossible to present the subject of therapeutics in a manner suited to the minds of all members of a large class; probably only a minority of them are reached. On the other hand, with small sections, at the bedside, the instructor comes in contact with the individual student and his difficulties, and may thus appreciate what he has failed to grasp. It is an advantage to have the bridge that connects the teaching of therapeutics with its application in practice built and used in the medical school, where the student can have assistance in this difficult task, rather than that unaided he should attempt its construction out of what he has heard in his lectures and recitations on the one hand, and his clinical inexperience on the other.

My plea is for a careful, painstaking rehearsal at the bedside by the student of what he is to do as a practitioner. Let him first be trained without taking responsibility, and when the time comes, this training will help him to give a good account of himself in his fight against disease, and to choose and carry out the proper measures.

The Nightcap.—W. J. B. Selkirk in the *Lancet* (London), Sept. 7, 1918, sets forth the advantages of the nightcap (not the liquid one) for the promotion of sleep. He believes that our grandmothers and grandfathers did not wear the nightcap as a matter of vanity, but that their experience proved that it was an aid in the wooing of Morpheus. He says this experience is confirmed by that of soldiers in the present war who wear the knitted helmet in camp and billet and dugout, and who find its warmth most soothing and comforting and promotive of sleep. He says it might be used with benefit by civilians suffering from insomnia not of gross organic origin. In addition to keeping the head warm, especially for those whose natural head covering has become sadly thinned or has disappeared for the most part, the cap or helmet also acts as a sleep promoter by shutting out extraneous sounds, thus helping to decrease the intensity of sense impressions which distract the would-be sleeper from the work in hand. In this connection he calls attention to the custom of soldiers (and many civilians too, perhaps) of imitating the habit of the dog which sleeps curled up, with his nose covered, and of the bird which sleeps with its head under its wing, in pulling the blanket completely over his head to facilitate sleep. In this manner he not only keeps his head warm and shuts out disturbing noises and other exciting sense impressions, as by the use of the nightcap, but by rebreathing his own carbon dioxid he half anesthetizes himself so that he sleeps soundly and wakes slowly, even passing through a more or less confused phase resembling the waking from a brief anesthetic state. While not to be recommended from the standpoint of healthful, refreshing sleep as in fresh air, this habit does promote sleep as does the now discarded nightcap of our grandparents.

THE PROBABLE ENDOCRINE ORIGIN OF PEPTIC ULCER*

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The consensus of opinion is that chronic ulcer in man develops from the acute ulcer, and that the acute ulcer must necessarily be preceded by an initial lesion. Once the initial lesion is formed, its further development through the various stages into the chronic ulcer is attributed to the corrosive action of the hydrochloric acid of the gastric juice. However, intrinsic causes, such as the mechanical irritation of food on the ulcerated area, and extrinsic causes, such as epigastric pressure from abnormal posture, are other agents helping to produce chronicity. The presence of hyperchlorhydria in conditions other than ulcer, and the absence of ulcer in true achylia gastrica, though occasionally lesions in the stomach may be present in the latter condition, are facts suggesting that hydrochloric acid is a secondary, though prominent, factor in effecting the beginning of an ulcer. It is not the main etiologic factor.

Various theories have been advanced explaining the cause of peptic ulcer. Of these, the hypothesis based on the endocrine origin of ulcer is most probable. It attributes the initial lesion primarily to a disturbance in internal glandular secretion, which causes a disturbed equilibrium in the vegetative nervous system, both vagus and sympathetic, and consequently, functional disturbances in the various organs supplied by these nerves. Eventually, the continued functional disorder produces pathologic lesions and clinical symptoms.

CAUSES OF INITIAL LESION

Briefly stated, the initial lesion is attributed to an interference with the blood supply in a limited area of the gastric or duodenal mucous membrane. The circulatory disturbance may be, first, an ischemia of that part of the mucous membrane involved as a result of a spastic contraction either of the small artery or of the musculature surrounding that artery, both instances causing the occlusion of the artery; or the circulatory disturbance may be, second, a stasis of the blood in the small artery, either through vasodilatation or through pull on the vessel wall by relaxation of the musculature surrounding that vessel. Be it stasis or spastic contraction, there is an interference with the blood supply and hence with nutrition. To this is attributed the origin of the initial lesion, and subsequently ulceration takes place.

Because of an irritation arising from disturbances of internal secretion, the terminal nerve fibers of the vagus may produce a spastic contraction of the muscularis mucosae in localized areas, causing an occlusion of the smallest arteries contained in those particular areas. This continued spastic contraction of the musculature gradually causes an ischemia of the area supplied by the blood vessel. This ischemia interferes with the nutrition and, with the aid of the corrosive action of the hydrochloric acid, ulceration results. The same is true for spastic contraction of the vessel wall itself. The initial lesion, however, need not necessarily arise from vasoconstriction. It may originate from dilatation of the vessel. Because of reduced stimulation of the splanchnic nerve or through pull on the vessel walls by relaxation of the surrounding musculature from the diminished vagus stimulation, stasis of the blood in the smallest arteries occurs with an interference to nutrition. The next step is ulceration. But the vegetative nervous system, vagus and sympathetic, is fundamentally the main etiologic factor, for it originally affects the blood vessels or muscles causing the constriction or dilatation, contraction or relaxation. The vegetative nervous system in turn is dominated by the glands of internal secretion.

What may be assumed possible for small areas of musculature is a well known fact for larger areas. Gastrospasm, pylorospasm, etc., or gastric atony exist without the presence of ulcer. The fact that peptic ulcer is associated frequently with hypertonic or spastic stomach does not permit the assumption that the hypertonicity or spasticity is due to the ulcer. Were this true, one would not find ulcer associated with the subtonic stomach. It is not unreasonable to suppose, however, that the ulcer, once developed, sustains the spasm. Disturbances in motility, therefore, occur independent of ulcer.

Gastric atony or gastric spasticity is attributed to gastric neurosis, due to a disturbed equilibrium in the gastric nerves. This may manifest itself independent of the ulcer, but the existence of the ulcer is impossible at least without the local neurosis. This gastric neurosis is due to a disturbance in one or more of the endocrine glands. The disturbance is purely a functional one and has been termed ductless gland neurosis. To recapitulate briefly, the initial lesion of ulcer is due to (1) the ductless gland neurosis; (2) the influence of this neurosis on the vegetative nerves, resulting in the (3) gastric neurosis with atony or spasticity; (4) the disturbed circulation, caused by (*a*) ischemia from vasoconstriction of the small arteries or from pressure by the spastic contraction of the muscularis mucosae, or (*b*) stasis from vasodilatation, or by pull of the musculature on the vessel wall; (5) subsequent ulceration; (6) etiologic factors in the production of chronicity.

ETIOLOGY

Ductless gland neurosis was first emphasized by Bauer[1] and later by Hemmeter,[2] who states that there are cases of exophthalmic goiter which were characterized by all the phenomena of that disease, but which were not relieved by thyroidectomy and in which parts of the removed thyroid were found to be normal. No hyperplasia of secreting vesicles, no liquefaction of colloid material and no small round cell infiltration were noted. Cases are reported in which the full clinical picture of exophthalmic goiter developed in women with a rather sudden onset due to mental excitement.

According to Canon,[3] violent emotion causes an output of epinephrin from the suprarenals. Such repeated functional disturbances in the suprarenals may lead eventually to cessation of gastro-intestinal

* Read before the Section on Gastro-Enterology and Proctology at the Sixty-Ninth Annual Session of the American Medical Association, Chicago, June, 1918

1. Bauer, J.: Zur Functionsprufung des vegetation Nervensystems, Deutsch. Arch. f. klin. Med., 1912, **107**, 39.
2. Hemmeter, J. C.: Hypertonicity and Hypotonicity of the Vagus and the Sympathetic Nervous System, New York Med. Jour., 1914, **99**, 101.
3. Canon, W. B., and de la Paz, D.: Emotional Stimulation of Adrenal Secretion, Am. Jour. Physiol., 1911, **28**, 64.

movement, dilatation of the bronchi, increased blood pressure and glycosuria. All these phenomena may be produced experimentally by the intravenous injection of epinephrin.

So, too, exophthalmic goiter, at least at the very beginning, must be a functional disease. Likewise, glycosuria or mild diabetes may show the islands of Langerhans in the very early stages of the disease to be normal; or even achylia gastrica, which is probably at first a true neurosis, may be at the very start a functional disturbance, but later on may show a pathologic lesion, namely, atrophy of the glands.

Depressive states, on the contrary, may produce suppression of the thyroid secretion or suppression of the epinephrin secretion. It seems that in exophthalmic goiter not only excessive quantities of sympathetic and vagal products pass into the blood stream, but also epinephrin. This is proved from the researches of Leo Adler[4] and others who found in the blood serum of all patients suffering from exophthalmic goiter a high percentage of epinephrin. The symptoms and signs therefore in exophthalmic goiter will vary, depending on the excesses of the various chemicals entering into the blood stream from the thyroid.

The effect of the various secretory products of the thyroid on the gastro-intestinal tract is of vast importance. The thyroid has a double innervation, sympathetic and vagus. If the sympathetic products predominate, a condition which occurs in the majority of cases of exophthalmic goiter, anacidity or hypacidity will be found, since sympathetic products inhibit gastric secretions to a great extent. In instances in which the sympathetic and vagal products are discharged in equal quantities into the circulation, hyperchlorhydria may be found. The pure vagotonic type of exophthalmic goiter, although assumed by Eppinger and Hess,[5] is rare. However, in many cases of exophthalmic goiter the effect of vagal excitation is evident, namely, gastro-intestinal disturbances, vomiting and profuse diarrhea, all being manifestations of a thyrotoxicosis.

Crotti[6] states that the stomachs of patients with exophthalmic goiter in whom the gastro-intestinal symptoms are most pronounced, on repeated fluoroscopic examinations, show a state of more or less constant spasticity. There are, however, those patients with exophthalmic goiter who are obstinately constipated. In such persons few vagal signs are noted, and the constipation may be due to increased intestinal inhibition from the sympathetic excess. Furthermore, Iscovesco[7] has isolated from the thyroid a lipoid substance, injections of which into animals produced the typical picture of thyrotoxicosis. All these facts indicate that exophthalmic goiter is a mixed neurosis attributed to an overproduction of sympathetic and vagal products of the thyroid. Thus the sympathetic overflow manifests itself chiefly on the secretions of the stomach, and the vagal on the peristalsis. All grades of functional disturbances may occur from very severe to very mild. Again, there may be an overproduction of the sympathetic products or there may occur a disturbance in the thyroid gland in which the vagal products will be produced in larger quantities than the sympathetic, or both vagal and sympathetic may be manufactured in excessive amounts, as happens in cases of exophthalmic goiter with severe gastro-intestinal disturbances. Small quantities of vagal products, due to minor disturbances in the thyroid, may lead to marked alteration in the peristalsis and secretion of the stomach. Such a mild vagal neurosis may be the underlying cause of the gastric neurosis.

Suprarenal insufficiency, however, may influence the peristalsis and secretion in the same manner as occurs in vagal thyroid neurosis, for the sympathetic impulses are diminished, and, as has been discussed elsewhere, suprarenal deficiencies mean various grades of vagotonia. There are no reports of fluoroscopic findings in Addison's disease, but in two cases, the gastric analysis showed hyperchlorhydria, and in addition, blood examination showed an eosinophilia, both findings being common in vagotonia.

The sluggish digestion and atony of the stomach and the bowels in myxedematous patients are quite characteristic. Anacidity and hypochlorhydria is the rule in this condition. The cause of the diminished secretion is slightly different from that observed in exophthalmic goiter, since in the latter it is caused by sympathetic inhibition, while in the former by diminished vagal excitation.

The decreased peristalsis of the gastro-intestinal tract in a myxedematous patient is attributed to an absence of the vagal products of the thyroid in the blood stream, as a result of depressive causes leading to the vagal neurosis in that gland. Lane,[8] for instance, believes that intestinal stasis is due to subthyroidism. Since epinephrin inhibits intestinal and gastric peristalsis, a condition similar to the peristalsis observed in myxedema should be expected in hyperfunction of the suprarenals or in the suprarenal neurosis of suprarenalemia.

Parathyroid insufficiency seems to lead to spasticity of the stomach. In two cases of ulcer with tetany, Bine[9] reported the presence of pylorospasm. Thus, parathyroid hyperfunction must have an inhibitory effect on peristalsis.

The pituitary body, the action of whose products are on the extended vagus or pelvic nerves, may be excluded from consideration in regard to gastric peristalsis, and, hence probably plays no rôle in the origin of the initial lesion of ulcer.

Hypersecretion or hyposecretion are secretory disturbances found in gastric neurosis and peptic ulcers. The secretion of the duodenal mucosa shows its effect on pancreatic and intestinal secretion through the blood stream, and Edkins gastrin, or as Starling calls it, "gastric secretin," shows its effect through the same route on gastric secretions. The secretins are endocrine products of the gastric and duodenal mucosa. Gastrin belongs to the same class of hormones as the duodenal secretion, which, according to Fürth and Schwarz,[10] is a mixture of several substances possessing the properties of exciting secretion, of which the most important is cholin. Cholin is essentially a vagotrope substance, which in excess may excite the secre-

4. Adler, Leo.: Untersuchungen uber den Adrenalingehalt des Blutes, Deutsch. Arch. f. klin. Med., 1914, **114**, 283.
5. Eppinger and Hess: Die Vagotonie, Berlin, Hirschwald, 1910.
6. Crotti, André: Thyroid and Thymus, Philadelphia, Lea and Febiger, 1918.
7. Iscovesco, quoted by Crotti: Thyroid and Thymus, p. 51.
8. Lane, quoted by McGarrison: The Thyroid Gland in Health and Disease, William Wood and Co., New York, 1917, p. 188.
9. Bine, René: Duodenal Ulcer and Tetany, The Journal A. M. A., May 5, 1917, p. 1315.
10. Fürth and Schwarz, quoted by Biedl, Arthur: The Internal Secretory Organs, English translation by Linda Forster, New York, William Wood & Co., 1913, p. 439.

tory vagus fibers, and in deficient quantities may cause suppression of gastric secretion.

Although these products, or, as Starling calls them, chemical messengers, act directly on the glands through the blood stream, they may also influence the secretory fibers of the vegetative nerves. Since the true ductless glands exert their influence on the vegetative nerves, the influence of these glands directly on the secretions of the stomach and the bowels is probable.

One must not, however, deny the influence of the central nervous system on the gastric secretion. This is evident from the effect of the sight, smell, and taste of food on the secretion of gastric juice. Through the epoch-making works of Starling, Pawlow, Canon[11] and others, it became a known fact that the maintenance of the body is to a large extent independent of the central nervous system.

Through the plexuses of Meissner and Auerbach, acting conjointly with the sympathetic ganglions, the central nervous system has apparently a minor influence on the gastro-intestinal tract, but the processes of digestion are still controlled by hormones. In regard to the gastro-intestinal peristalsis, however, the central nervous system, together with a reflex mechanism, must be considered. Thus, for instance, the acid secretion which is elaborated in the gastric mucosa, causes the pyloric sphincter to relax at regular intervals; and also, as another example, the movement of the intestines is provoked by the bowel contents. It is not unreasonable to assume that there is also a nervous reflex, which is set in motion by the secretion of the gastric and intestinal mucosa to control peristalsis. Still, one must admit that the movements of the stomach and bowels are chiefly regulated by the chemical communication from one part of the intestine to another or through the agency of products from the endocrine glands circulating in the blood stream and acting directly on the nerves or musculature.

Altered function in the endocrine glands, therefore, will lead to altered peristalsis. This possible dependence of the disturbed peristalsis on the products of internal secretions was suspected by William Mayo,[12] in a paper of 1907, in which he said: "The curious blending of the sympathetic with the ductless glands is exemplified in the suprarenals, thyroids and parathyroids. Here we may possibly get an explanation of that close association which exists between pyloric spasm, atonic dilatation, prolapse of the stomach and gastric neurosis."

The excesses or the deficiencies of products of the endocrine glands, producing manifestations of the ductless gland neurosis, passing through the blood stream, act directly on the muscle, causing pylorospasm, gastrospasm, hour-glass stomach or cardiospasm—various grades of atony. These excesses or deficiencies may also show their effects on minute limited areas of the muscularis mucosae or the mediums of the vessels producing the ischemia or stasis, either of these conditions leading to circulatory interference and altered nutrition. From these localized areas of ischemia or stasis, lesions occasionally form probably in the entire intestinal tract, as well as in the stomach and duodenum, but, on account of the absence of the hydrochloric acid, ulceration does not occur, at least with the characteristics of ulcus rotundum. These latter lesions may become the site of bacterial invasions, as in the appendix, for instance. The bacteria may become pathogenic and lead to a true appendicitis. Aschoff[13] and others do not believe in the bacteriologic origin of appendicitis, and, also, according to Hertogne,[14] appendicitis is due to thyroid insufficiency. Further, the frequent association of peptic ulcer, gastric or duodenal, with appendicitis, suggests that appendicitis is due also to an endocrinous origin.

That a neurosis precedes the ulcer is evident from reliable statistical data. Many authorities have compiled statistics and reports of cases in which neurosis preceded the ulcer. Cackovic[15] carefully analyzed histories of 172 cases of operatively demonstrated ulcer. In 18.5 per cent. of the patients, the initial symptoms appeared between the ages of 10 and 19 years; in 32 per cent., between the ages of 20 and 29 years; in 29 per cent., between the ages of 30 and 39 years, and in 18 per cent., after 40 years. The initial symptoms of ulcer are found in the third decade of life, at a time when neurosis is most frequent, but the operative evidence of the presence of an ulcer, however, is for obvious reasons obtained late in life.

Clinical observations prove that many patients afflicted with peptic ulcer present vegetative stigmata as evidence of the general neurosis. Peptic ulcer patients often respond to the pilocarpin test positively, or to the epinephrin test, or to both. Westphal and Katsch,[16] who have made an extensive study of the vegetative stigmata and who have completely enumerated all of them, found these stigmata to be absent only in the middle-aged; and these do not respond to either of the drugs. But signs of a disturbed equilibrium of the stomach, the signs of local gastric neurosis, are common in ulcer patients in all ages. They are hypermotility or spasticity, hypomotility or various grades of atony, and hyperchlorhydria, rarely hypochlorhydria, hypersecretion or hyposecretion. The hypertonic type of stomach and hyperchlorhydria are more often observed than the atonic type and hypochlorhydria.

Symptoms and signs of vagotonia or sympathicotonia or both, pointing to a general or local neurosis, are seen in the patients during the whole course of the disease and frequently persist after the patient has been considered medically or surgically cured. In a recently published paper,[17] it is shown why great value should not be placed on surgical, as well as medical, statistics concerning ulcer cures. The gastric neurosis ceases when the ductless gland neurosis has ceased, and this may often be accomplished by nature, assisted by medical or surgical procedures.

A ductless gland neurosis may, in the course of time, lead to actual pathologic changes within the gland itself, as happens to the islands of Langerhans from slight changes to their complete atrophy as in severe cases of diabetes, or as in the well known changes in

11. Starling, Pawlow and Canon; quoted by W. J. Mayo (Footnote 12).
12. Mayo, W. J.: The Contributions of Surgery to a Better Understanding of Gastric and Duodenal Ulcer, Tr. Cong. Am. Phys. and Surg., 1907, **7**, 108.
13. Aschoff, L.: Pathologische Anatomie, Ed. 3, Jena, Gustav Fischer, 1913, **2**, 793.
14. Hertogne, quoted by McGarrison (Footnote 8), p. 188.
15. Von Cackovic, M.: Ueber das Ulcus ventriculi im Kindesalter und seine Folgen, Arch. f. klin. Chir., August, 1912.
16. Westphal and Katsch: Das neurotische Ulcus duodeni, Mitt. a. d. Grenzgeb. d. Med. u. Chir., 1913, **26**, Gustav Fischer, 1913.
17. Friedman, G. A.: Should Chronic Peptic Ulcer be Treated Medically or Surgically? Am. Med., 1918, **13**, 109.

exophthalmic goiter. This may explain the pathologic changes in the ductless gland found in patients afflicted with ulcer. The pathologist Cesaris Demel,[18] who investigated at necropsies the suprarenals in ulcer cases, found marked gross changes in the five examined.

Finzi,[19] in quoting him, suggests that in all necropsies of ulcer cases, the suprarenals should receive due investigation. Changes should also be looked for and noted in the thyroid.

RESULTS OF ANIMAL EXPERIMENTATION

The results of animal experimentation are also suggestive as to the probable endocrine origin of peptic ulcer. The acute ulcers in animals, produced in former experiments, heal rapidly. Panum and Conheim,[20] for instance, found ulcers with all their characteristics after injecting lead chromate into one of the gastric vessels arising from the splenic artery. Such animals, killed within a few days after the experiments, showed the typical acute ulcers, but all animals killed after the second week had a normal mucous membrane. The experimental ulcers heal because the constitutions of animals cannot be changed by experimentation.

Vagotonia, sympathicotonia, or a combination of both, are, according to Eppinger and Hess, constitutional anomalies. Experiments have been performed to alter the constitution in the animals, to imitate in a rather rough manner vagotonia and sympathicotonia in man. Lesions, erosions, or acute ulcers were produced by experimentally causing hyperfunction through injections of products of internal secretions, or by causing deficiencies in some of the ductless glands by partial or complete removal of the glands.

Acute ulcers in the stomach or duodenum, or in both, were obtained after complete or partial removal of the suprarenals by Finzi and myself[21] in dogs and rabbits, by Elliot,[22] in cats, and by Mann[23] in dogs. After partial parathyroidectomy, Carlson and Jacobson[24] observed acute ulcers in the stomach and duodenum of dogs, and I observed them in dogs and rabbits. After repeated injections of desiccated thyroid extract, gastric ulcers were noted in dogs and rabbits, and after repeated epinephrin injections, lesions or acute duodenal ulcers were observed in dogs and, occasionally, in rabbits. Peptic ulcers were obtained by Westphal[25] after pilocarpin injections in rabbits, dogs and cats. I found gastric ulcers after such injections in rabbits, and gastric and duodenal ulcers or lesions, after injecting into rabbits, pilocarpin and epinephrin alternately.

Pilocarpin closely resembles thyroid extract in its action. Injections of thyroid extract in animals lead to profuse diarrhea, similar to the action of pilocarpin injections. The effect of pilocarpin is greatly reduced in thyroidectomized animals. By feeding animals or man with thyroid extract, one obtains results which resemble greatly the pharmacologic action on the administration of pilocarpin: diarrhea, perspiration, respiratory disturbances, lymphocytosis and eosinophilia. The cells of the thyroid, according to Wyss and Schafer,[26] react to pilocarpin in the same way as the cells of the true secretory glands.

In all the experiments, the lesions or ulcers obtained were often single. In none of the animals were there the characteristics of chronic ulcer noted in man, but the tendency against healing was often evident. This was especially noted in our[27] animals in which an ulcer was found several months after the parathyroidectomy was performed. Finzi also emphasizes this lack of healing power after partial suprarenalectomy. That the ulcers obtained in all the animals were really due to an intentional disturbance in the glands, is clear from the fact that in rabbits in which epinephrin was injected or suprarenals implanted (Finzi), after removal of the suprarenals, the mucous membrane of the stomach was found to be intact, the same as the mucosa of the animals used as controls.

As the main purpose of all the experiments in which the endocrine glands were removed or the products of these glands injected was to imitate the constitutional anomalies found in man, such experiments, I believe, are of greater value than those hitherto described. These experiments are especially of great interest and benefit because they demonstrate the possible relation of the lesions or ulcers to a disturbed motility.

The animals, which received repeated injections of thyroid extract for several weeks, suffered from diarrhea, practically after the second injection, and similarly profuse diarrhea was a conspicuous feature in those injected with pilocarpin. The dogs, however, were obstinately constipated on repeated epinephrin injections, during the period of the injections. Constipation was not a prominent feature in rabbits which were injected alternately with pilocarpin and epinephrin. In the rabbits injected with pilocarpin alone, in which a necropsy was done soon after the last injection, the stomach frequently presented the various stages of spasticity, that is, pylorospasm, gastrospasm, hour-glass stomach and even cardiospasm. In the animal at necropsy several months after the thyroidectomy, the stomach was often markedly dilated without the presence of any obstruction. The stomach resembled greatly the atonic stomach observed under the fluoroscopic screen in ulcer cases. On histologic examination, sections of the stomach showed fatty infiltration or fatty degeneration in the gastric musculature, especially near or at the pylorus.

One must assume that this infiltration is similar to that observed in the musculature of the tongue and skin in myxedematous patients. Pilocarpin produces irritative conditions in the vagus, resulting in spastic stomach and in increased intestinal peristalsis, and also contracts, according to Pal,[28] the mesenteric vessels. Injections of thyroid extract must have a similar effect, namely, diarrhea and spastic contraction of the stomach. The spastic stomach is also observed clinically by fluoroscopy in exophthalmic goiter cases with severe gastro-intestinal disturbances. Irritative states in the

18. Demel, Cesaris, quoted by Finzi (Footnote 19).
19. Finzi, Otello: Ueber die Veränderungen der Magenschleimhaut bei Tieren nach Nebennierenextirpation und über experimentelle erzeugte Magengeschwüre, Virchows Arch. f. path. Anat., 1913, **214**, 413.
20. Panum and Conheim, quoted by Suzuki: Ueber experimentelle Erzeugung des Magengerschwuere, Arch. f. klin. Chir., 1912, **98**, 632.
21. Friedman, G. A.: The Influence of Removal of the Adrenals and One-Sided Thyroidectomy upon the Gastric and Duodenal Mucosa; the Experimental Production of Lesions, Erosions or Acute Ulcers, Jour. Med. Research, 1915, **32**, 287.
22. Elliot, T. R.: Some Results of Excision of the Adrenal Glands, Am. Jour. Physiol., 1915, **40**, 38.
23. Mann, Frank K. C.: A Study of Gastric Ulcers Following the Removal of the Adrenals, Jour. Exper. Med., 1916, **23**, 203.
24. Carlson, A. J., and Jacobson, Clara: Further Studies on the Nature of Parathyroid Tetany, Am. Jour. Physiol., 1911, **28**, 133.
25. Westphal, Karl: Untersuchungen zur Frage der nervösen Entstehung peptischer Ulcers, Deutsch Arch. f. klin. Med., 1914, **114**, 327.
26. Wyss and Schafer, quoted from Biedl (Footnote 10), p. 28.
27. Friedman, G. A.: Jour. Med. Research, 1918, **38**, 69.
28. Pal, quoted from Biedl (Footnote 10), p. 200.

vagus must exist, as it was explained, in the animals, after partial or complete suprarenalectomy, or after parathyroidectomy, for peptic ulcer cases with tetany and pylorospasm have been observed. Thyroid deficiencies, caused by thyroidectomy, produce hypotonic conditions due to diminished vagal stimulation. Epinephrin injections, as in experimental suprarenalemia, produce hypotonic conditions, due to increased inhibition of the splanchnic nerves.

Therefore, the hypertonic stomach, or the subtonic stomach, in which the presence of an ulcer may be demonstrated, is attributed primarily to a disturbance in the thyroid or in the suprarenals. If the effect is on minute localized areas of the organ, ischemia or stasis, as explained, results. The initial lesion of ulcer gradually develops and through the secondary factors mentioned, the typical ulcer is produced.

CONCLUSIONS

1. The initial lesion of the peptic ulcer is due to vascular changes, such as ischemia or stasis, attributed to contraction or dilatation of limited areas of musculature either of the vessel itself or of the muscularis mucosae surrounding that vessel.

2. The spastic or subtonic stomach of gastric neurosis may lead to these vascular changes. The spastic stomach is caused by deficiencies in parathyroid or epinephrin secretions, or, by excesses of one or more of the thyroid products. The subtonic stomach is due to deficiencies in thyroid products or to excesses in parathyroid or epinephrin secretion.

3. The altered peristalsis in peptic ulcer is produced chiefly by glandular neurosis, either in thyroid suprarenals or parathyroids.

4. The ductless gland neurosis causes secretory disturbances either directly or indirectly, by centering its influence on the pyloric or duodenal mucosae, endowed with endocrine properties.

5. The functional disturbances in the true endocrine glands may, in the course of time, lead to actual pathologic changes in themselves.

6. Acute experimental ulcer after partial parathyroidectomy of partial suprarenalectomy does not show a tendency to heal.

7. The spastic stomach may frequently be produced experimentally by injections of pilocarpin, whose pharmacologic action is similar to that of thyroid extract.

8. Atonic dilatation is observed after partial thyroidectomy.

9. Hydrochloric acid is an important factor in the further development of the acute ulcer from the initial lesion.

10. Clinical observations in conjunction with experimental findings suggest the endocrine origin of the initial lesion of peptic ulcer.

ABSTRACT OF DISCUSSION

DR. FRANK C. MANN, Rochester, Minn.: There is no doubt that the chronic ulcer must have an acute beginning. It is a different question, however, whether or not acute ulcers, from all causes, or from only one or two particular causes, develop into the chronic ulcer as it is seen in man. The relationship of the ductless glands to the production of ulcer is certainly closely associated with the relationship of the nervous system to the production of this lesion. Acute ulcers are quite easily produced by a score or more of methods. My work is in entire accord with the experimental work of Dr. Friedman. It is a different problem, however, to produce the chronic indurated type of ulcer. In a series of about 200 experiments, in which I removed only one suprarenal, only one chronic ulcer was produced. Extirpation of both suprarenals probably produces ulcer in 95 per cent. of the cases. The part a toxic condition plays in the production of chronic ulcer is not clear. I have received communications from a large number of laboratories, both in this country and abroad, stating that in their work in Pasteur institutes, or in studies of diphtheria toxin, they found that the injection of the toxin produced a double lesion, one in the suprarenals, and one of the mucosa of the stomach (the acute ulcer), and they felt that there was a relationship between the two. I believe it would be very difficult to tell whether the two were dependent on each other, or both dependent on the toxic condition. I am inclined to believe that if we have any severe toxic state, we have the elements for the formation of acute ulcer, and that a chronic ulcer will develop on any of these.

In a small series of cases of Addison's diseases in which I witnessed the necropsy, I have found only one case in which there was a chronic ulcer. In this case there also were a small number of acute ulcers. Certainly, in the formation of these acute ulcers we have two things: first, something in regard to the relationship of the anatomic mechanism of the gastric mucosa and its adjacent muscularis, together with some toxic factor which changes the condition of the cell, and the digestion of the gastric juice. For instance, in these ulcers which follow conditions like double suprarenalectomy, you will not get ulcers if a portion of the lower intestine is implanted into the stomach; in other words, the mucosa of the implanted jejunum will remain normal, although ulcers may occur around the stomach, showing that there is some definite condition in the mechanism of the mucosa of the stomach. And the same fact is true of the upper portion of the duodenum.

DR. V. A. LAPENTA, Indianapolis: We have too great a tendency to crystallize our views of these chronic lesions to infections solely. I believe that it can be stated by all men who have had more or less experience with these lesions, that such patients unmistakably exhibit either a type of vagotonia or sympathicotonia, I have never seen a patient with either acute or chronic ulcer, and especially chronic ulcer, who was not either a vagotonic or sympathicotonic individual. I do not believe that Dr. Rosenow's work disputes Dr. Friedman's findings. In fact, his work in the production of gastric and duodenal ulcer, with special strains of streptococci, by him isolated, is rather corroborative, because in the intravenous injection or parenteral injection of such toxins and proteins, with their peculiar atomic structures, there is caused a disturbance of the suprarenal system, with resultant sympathicotonia or vagotonia. This is the first step in the suprarenalogic reaction in the molecular processes. The bacteria find in the devitalized piece of gastric mucosa a most suitable place to localize, and ulcer is produced. Dr. Rosenow's work really brings experimental evidence to Dr. Friedman's contention. We must bear in mind another thing: Peptic ulcer is a disease of civilization. You never saw peptic ulcer in imbeciles; it is mostly a disease of very nervous individuals; it is a disease of civilization.

This seems to emphasize the question of the energy intake and the energy output, and the rôle played in the equilibrium by the suprarenal system. In the modern conception the high kinetic drive, the insult to the vasomotor balance that is brought about by these nervous emotions will in the course of time, naturally not months or days, lead to localized angioneurosis, which when present in the gastric mucosa, may result in peptic ulcer.

Several years ago it was pointed out that once an area of decreased resistance is formed in the stomach, gastric juice corrosion will do the rest, and if there are foci of infection, then you have a true cycle, and you are going to have an ulcer, and in nine cases out of ten that ulcer will become chronic. I believe that Dr. Friedman showed very active round cell infiltration in his specimens. This is very suggestive of the final result.

DR. BERTRAM W. SIPPY, Chicago: For half a century it has been generally recognized that ulcer of the stomach or duodenum develops in approximately the following manner: A

small, circumscribed or local area in the mucous membrane of the stomach or duodenum for some reason loses its normal resistance to the peptic action of the juices and becomes digested. This resistance to the normal condition of the peptic action of the gastric juice was first supposed to have been brought about by malnutrition or necrosis. In 1855 Malnekow pointed out that it was a vascular condition of some kind that had to do with the interference of the normal resistance, this corrosive action of the gastric juice. From that time on a large amount of experimental work has been done. Injection of lead salts has tended to prove that if you interfere with the nutrition of the mucosa of the stomach or duodenum a peptic ulcer will result. A large number of means have been used to produce the peptic ulcer, or the ulcer in the stomach or duodenum, but all of them, so far as we can make out, have to do either with spasm or the introduction of some toxic substance, of bacteria, of a ligature or something that interferes with the nutrition of the mucosa. The arteries of the stomach are end arteries entirely; that is, they have very few anastomoses. These experimental ulcers, produced in that way, heal rapidly, relatively speaking. The reason was thought to be, and probably is, that a raw spot is not an ulcer. There is a difference between these experimental ulcers and the clinical ulcers. This experimental ulcer destroys the mucosa. The base of this ulcer may have nothing in it to cause it to lose its normal resistance to the peptic action of the gastric juice, and under such conditions that raw spot will heal just as well in the presence of hydrochloric acid and pepsin as it would if there were no hydrochloric acid and pepsin there. Nothing interferes with the blood supply to that part. In these chronic ulcers, those that do not get well, it is assumed that the tissue had lost its resistance to the peptic action of the gastric juice, and therefore the hydrochloric acid and pepsin would keep it from healing. It is possible that the bacteria in the walls of this ulcer have something to do with lessening the resistance of the tissue to the peptic action of the gastric juices. Corrosion of the gastric juice is the most important factor.

Dr. Martin E. Rehfuss, Philadelphia: About ten years ago Dr. Leo Loeb and I were engaged in the study of the experimental production of gastric ulcer. We found that we could administer to animals the venom of *Heloderma suspectum,* a form of venomous lizard obtained in New Mexico, and in that way produce an acute ulcer. We injected alkali into the stomach of these animals and found that this alkali reduced the possibility to ulcer formation. We gave the animals herudin. In several instances the animals bled to death in their own stomachs. We then tried other substances, or caused acute toxemia in the animal, tried pilocarpin and atropin, which are supposed to act on the vagotonic system. We tried the effect of hydrochloric acid, phenol, copper sulphate and bacterial toxins. We found that every variety of substance produced an acute ulcer lesion of the stomach; it was something of a hemorrhagic lesion.

I saw some of the animals that Dr. Rosenow used in his experiments, and the lesions which he showed at that time were just the same sort as we succeeded in producing with various toxic substances. Shortly after that I went to Paris to the Pasteur Institute. I collected the stomachs of a very large number of laboratory animals dead of various bacterial infections. It is possible to produce a form of ulceration with almost every toxic substance if you can get the animal in a sufficiently high state of toxicity. In other words, it is my belief, from the experiments we performed, that there is a form of ulcer which is not specific. Whether or not these ulcers become chronic, whether they resemble the chronic ulcer seen in man, I am not prepared to state; but one thing is certain, an acute ulcer, an acute corrosion, can be produced in a great variety of ways. If that be the case, what is the theory we should adopt? The experiments of Rosenow are most convincing. I have adopted the plan in all cases of ulcer treatment to administer at the same time an autogenous vaccine prepared from local foci in the nose, throat, teeth, etc. What that has done I do not know. I have not yet collected the statistics. In almost every instance it is possible to extract a form of streptococcus from the nose, teeth or throat; and in quite a few instances I have given the stock vaccines and the combined colon bacillus.

Bolton produced localized erosions and ulcer with gastrotoxic serums, and our photographs record that our ulcers are the same, or the areas, the small ulcers, the same as he has shown in his book.

Dr. G. A. Friedman, New York: I was misunderstood by the majority of those who took part in the discussion. My object was not solely to demonstrate experimental ulcers. We know that ulcers may be produced experimentally by various means. I explained in my paper that a condition such as ductless gland neurosis is possible, and that the latter causes the gastric neurosis which leads to spasticity or atony of the stomach. This spasticity or atony may show its effect on small gastric vessels, and in this way the initial lesion of ulcer may take place. I do not know the cause of chronic ulcer. I should first like to know the cause of acute ulcer. My object was to study the latter from a new view point, and it seems that the explanation given here brings the clinical work in close association with the experimental work, which connecting link was, I believe, overlooked by the gentlemen, except Dr. Lapenta.

I have never found chronic ulcer in any of my experiments, but I have observed ulcers without the tendency to heal in animals after parathyroidectomy. The ulcers were frequently found several months after the operations were performed. Similar observations regarding the failure to heal after parathyroidectomy were made by Finzi, an Italian investigator. Since acute ulcers produced by other means heal rapidly, the absence of healing power in the aforesaid experiments prove that constitutional anomalies can be imitated roughly in animals, and that the constitutional changes in man afflicted with ulcer prevent the ulcers from healing. From my experience with infectious diseases and oral sepsis in Russia I have not gained the impression that ulcer is commonly caused by infection. The infectious theory explains only one phase of the ulcer, while the explanation outlined here today covers several phases. Naturally the material which I have presented is not yet complete. I have presented this paper simply to stimulate others to continue this work.

Health Organization and Administration in Rural Districts.—If I were asked the question: "What one step would be of the most importance in the final creation of an adequate public health organization and administration in rural districts?" I should say—the creation of a public health consciousness in rural districts through the education of country boys and girls. If I had my way, I would take Professor Sedgwick from the faculty of the Massachusetts Agricultural College at Amherst and require him to teach public health and biology as a regularly prescribed course; and I would make it sufficiently attractive for Dr. Rosenau to resign his position at the Harvard Medical School and accept a like position on the agricultural school faculty at the University of Maine. In other words, I would appoint on all the agricultural school faculties throughout the United States first-class experts and teachers to teach the subjects of preventive medicine and public health as required courses, and to supervise extension work in these subjects. I would expect the agricultural school boy who is to return to the country life to learn as much about the human body and its diseases, and the methods of public sanitation, as he or she learns about the care and breeding of hogs, the raising of corn and wheat, and the scientific fertilization of the soil. These leaders would return to their respective home communities and plant the necessary seeds which would result in a ripe harvest of public health opinion and adequate organization and administration in rural districts. Furthermore, matters pertaining to personal and public health should be taught to the rural population in general through the agency of the extension divisions of our universities. It is high time for less discussion in Boston and other cities of rural health administration, and for more discussion in Podunk and other country communities of rural health problems and administration!—L. D. Bristol, State Health Commissioner of Maine, *Bulletin,* State Department of Health, August, 1918.

MICROSCOPIC STUDIES OF DISEASED PERIDENTAL TISSUES *

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Most of the material on which these studies are based came from the peridental membrane clinic at the Northwestern University Dental School. In all of these, therefore, there are alterations of a high degree. At the same time, there are portions of each fragment that are only moderately changed. Zenker's fluid was used most often for fixation, and either celloidin or paraffin used for embedding. Paraffin was finally selected as the routine procedure because it was possible to get thinner sections and serial sections were more readily obtained. Hematoxylin and eosin, or methylene blue and eosin were the chief stains used. Occasionally methylene blue was used alone. The serial section procedure has more than paid for the trouble it entails, as it is only in this manner that the changes can be followed straight through the block, and reconstructions of the various parts achieved. An especially good illustration of this is in the transitions that take place in the epithelial layers.

These studies were begun as a routine procedure on all pieces of the gingivae removed to give deep pockets in the subgingival space a better chance to be obliterated, with the idea of seeing just how much destruction of the essential structures had taken place. The studies are confined to a rather superficial portion of the soft tissues investing the teeth, and no pretense is made at this time to present them in any definite relationship to etiologic factors, or to suggest a classification. There seems to be a very definite and constant picture presented in each specimen, only the details varying either as to extent, or as to the circumstances of their origin, which are apparently the result of etiologic factors.

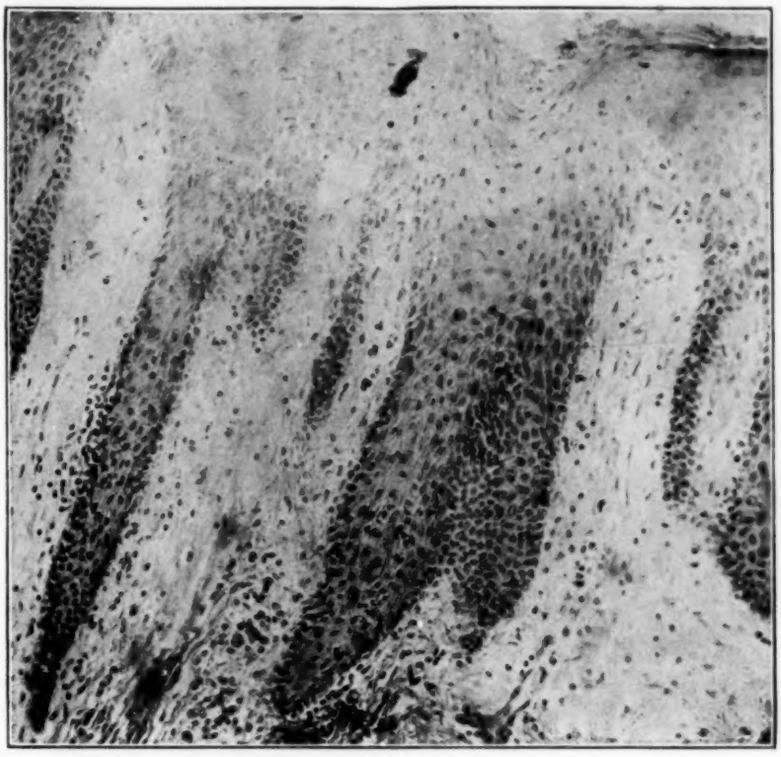


Fig. 1.—Elongated epithelial projections into the underlying tissues with accompanying round cell infiltration.

ALTERATIONS IN THE EPITHELIUM

Of all the changes, none are more picturesque than those occurring in the epithelial layers clothing the gingivae of these specimens. With one exception, they are probably not of vital importance, but they deserve description for two reasons, first, because they are part of the picture, and second, because there is a strong possibility of their being confused with other conditions.

An early alteration is the tendency of the epithelial projections into the subepithelial layers to extend themselves and so exaggerate the length of the papillae. A close examination of these projections will always reveal regions of infiltration along the basement membrane in the adjacent tissues, usually of the small round cell or lymphocyte type. These projections are slender, and as the condition advances, they twist and turn so that sections cut at any angle always have rounded, oval, or cylindrical masses of epithelium which seem unattached to any of the surface epithelium. By studying these in serial sections, we find it always possible to join them to projecting epithelial pegs. Such deformities of the epithelium are frequently found on the surfaces lying outside of the subgingival space, but they are rarely of any greater extent. It is a chronic or low grade inflammatory process.

But the epithelium, which lines the so-called pus pockets and which formerly was adjacent to the teeth, is always the site of other very noteworthy alterations. As this trough widens and deepens there is a tendency for the epithelium to project itself farther into the subepithelial tissues, and the forms of these projections become progressively more and more chaotic, the deeper they lie in the pocket. At the bottom, the surface continuity is no longer maintained in every case, but there are still masses of epithelial cells at the very bottom of every pocket examined thus far. These cords and projections are the seat of retrograde, disintegrating changes that begin at their centers. It is assumed that the older epithelial cells are less resistant to the destructive agents than are the new cells. Fragmentation of their nuclei, necrosis, infiltration with polymorphonuclear leukocytes, and other inflammatory cells all take place in a regular sequence, so that as an end-result the cylindric, ovoid, or spherical bodies become thin shells whose walls are composed of very new epithelial cells, and whose contents are more or less purulent fluid or semisolid material.

From the character of the epithelial cells, that is, their age, and their rapid destruction, these regions must be very unstable. The cells are small, with small nuclei which take the blue nuclear stains very deeply. They resemble the cells ordinarily found in the base-

* Read before the Section on Stomatology at the Sixty-Ninth Annual Session of the American Medical Association, Chicago, June, 1918.

ment membrane. It is easy to assume that these epithelial cells exhibit a negative chemotaxis to the products of this process in the gingival trough, and that they push down into the subepithelial layers stressed by this force. Small blood vessels are found in these regions in great numbers. They are frequently packed with polymorphonuclear leukocytes, and nearly always contain one or several of these cells. Red cells are often found in considerable numbers outside the blood vessels, even to the extent of small hemorrhages. These may be the result of surgical trauma. The cells are often separated as though by fluid. Possibly this is caused by an edema or it may be simply an artefact. All these products are being constantly extended into the subgingival space, which, as a result, becomes a pus pocket. To one not familiar with this type of inflammatory tissue, some of these malformations are strongly suggestive of malignancy. There is apparently no relation at all between the two conditions.

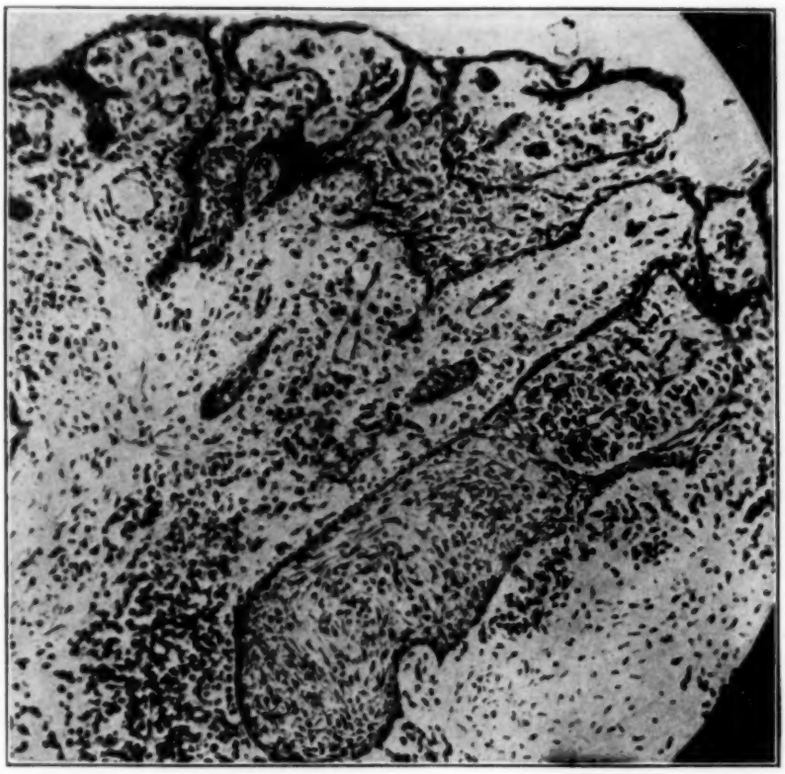


Fig. 2.—Epithelial deformities of the mucous membrane lying within the lining of the pus pocket.

INFILTRATIONS

The subepithelial regions as far as studied are characterized by inflammatory infiltrations which are invariably perivascular. Their distribution is most conveniently seen in buccolingual sections parallel to the long axis of the teeth. If the capillaries that supply the papillae just beneath the deformed and distorted epithelium are traced down into the deeper layers and their course followed even into the larger branches, just these and no others are the site of these infiltrations. In some sections, this border between healthy and infiltrated regions is most abrupt.

The infiltrating cells are most often of the small round cell type. There are large numbers of cells called plasma cells, with deeply stained cytoplasm and eccentrically placed nuclei. Occasional eosinophil cells are found, and polymorphonuclear leukocytes are not uncommon, especially in parts adjacent to degenerated epithelial projections. Unattached endothelial cells are frequently seen.

The vascular supply is very rich. The walls of the small veins and capillaries are often thickened, and many of these vessels are filled with polymorphonuclear leukocytes to the exclusion of the red cells.

The fibers of the gingivae and of the peridental membrane seem to be very susceptible to the destructive action of these forces. One of the first tendencies is for the fibers to lose their affinity for the stains, and either stain more faintly or react with the nuclear stains. Little by little, the fibers are replaced by the inflammatory infiltration. There are regions about the size of these epithelial ovoids which no longer have any cellular structure, and are occupied by a homogeneous staining substance. This seems to be some product of degeneration, either of dead epithelial cells or from some other necrotic process.

If a buccolingual section is carefully studied as to its form and the relations of its various parts, it will be found that a large portion of the free gingiva has disappeared. There is nearly always a mass of necrotic material lying on the epithelium at this point or just within the inner lip of the pocket. If the surface of the adjacent tooth is approximated, and the curve of the outer surface of the gingiva projected until it intersects with the buccal surface of its tooth, the amount of destruction may be very accurately estimated. There is a very marked tendency of the new crest to lie near a straight line drawn from the bottom of the pocket or the subgingival space to the nearest unaltered epithelium. If a line is drawn from the last point parallel to the distribution of the ascending capillaries down to the alveolar process, this line will mark the division between the healthy peridental membrane and the region in which there is inflammatory infiltration and destruction of the fibers of it. In the latter region, the infiltration is usually so marked as to assure the nearly complete destruction of the fibers, and in these advanced cases which are here described, there is no tendency to any reconstruction of them. As far as these tissues are concerned, when once the fibers are destroyed, they do not seem to be regenerated.

BACTERIA IN THE TISSUES

Bacteria have been demonstrated in various tissues by the newer methods of bacteriology, as well as by the more standard staining processes. Tubercle bacilli are often found in the tissues, as well as typhoid, plague, and the spirochete of syphilis in the lesions which they respectively produce.

More recently cocci have been demonstrated in the tissues during the course of various diseases, such as poliomyelitis and experimental scurvy. Curtis[1] found

1. Curtis, A. H.: Bacteria in the Uterus, Surg., Gynec. and Obst., 1918, **26**, 178.

cocci in uteri removed for various causes, and Rosenow[2] has described an infected root apex about which there was a small region of granulation tissue, in which he was able to demonstrate a latent group of bacteria, which were stimulated to growth by incubation in bouillon for ten hours. Then the tissue was fixed, sectioned and stained.

In spite of the fact that recent work has shown that bacteria invade the blood stream comparatively frequently in many conditions, yet it seems that there must be an easier way for bacteria to reach the peridental membrane and the apical region of the teeth, or even the pulp cavity, than by the blood stream. All these results, as well as the peculiar pathology of the regions about the vessels, stimulated a belief that bacteria could be found in these diseased gingivae.

Cultural methods were tried at first, but the pieces of tissue were so small that, by the time the external surfaces were sterilized by heat or hot oil, there was always a suspicion that the bacteria inside had been destroyed at the same time, that is, granting that they were there, or on the other hand, that contamination from the outside had not been ruled out.

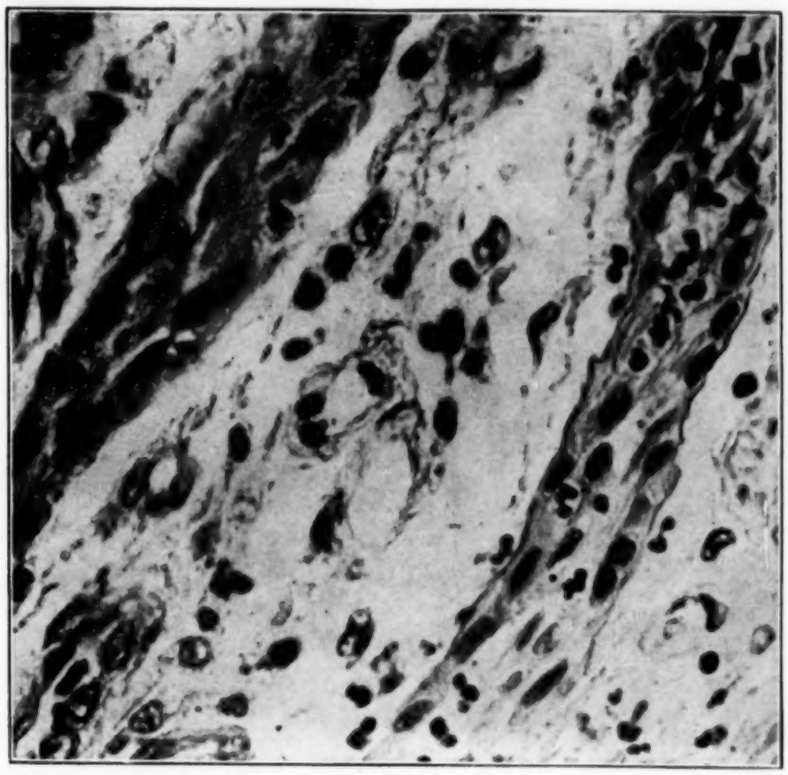


Fig. 3.—Polymorphonuclear leukocytes in the epithelial projections and the intervening spaces.

Thus far, bacteria have not been found in any large number of cases, and no attempt has been made to arrive at any conclusions as to the frequency with which they are found. The forms resemble those of the streptococci that have been found quite constantly in the pus pockets. For the great part, they lie about the vessels which are surrounded by the cell infiltrations already described, and are more frequently disclosed near the bottom of the pocket. They may be in small masses, or in groups of two, four, six or eight.

Their relation to the surrounding pathologic changes, or their ability to penetrate farther into the peridental membrane or down to the apical region, is conjecture and a subject for further investigation.

There is a very striking analogy between the location and the distribution of the lesions described in the foregoing and the distribution of the dental lymphatics, as demonstrated by Noyes[3] and Schweitzer.[4] It is known that the lymphatic vessels play an important part in the distribution of infection elsewhere in the body. With their demonstration in the peridental membrane as well as the pulp in a way that seems beyond equivocation, their importance from the standpoint of the part they play in the pathology of the tissues can hardly be overestimated. The distribution of these pathologic changes here described seems compatible only with the notion that they exactly parallel the distribution of the lymphatics in the same region. It answers the question why the line of progress is always downward and inward, why with a broad shelf-like erosion, as occurs under a salivary calculus, there is a broad band of infiltration, and why there is such an exact and abrupt division between the regions of infiltration and those free and uninvolved.

31 West Lake Street.

2. Rosenow, E. C.: Jour. Nat. Dental Assn., 1918, **5**, 118.
3. Noyes, F. B., and Dewey, Kaethe W.: The Lymphatics of the Dental Region, THE JOURNAL A. M. A., Oct. 12, 1918, p. 1179.
4. Schweitzer, G.: Ueber die Lymph Gefässe des Zahnfleisches und der Zähne beim Menschen und bei Säugethieren, Arch. f. Mikr. Anat., Berne, 1909, **74**, 927.

ABSTRACT OF DISCUSSION

DR. ARTHUR D. BLACK, Chicago: Those who have studied the work which Dr. Noyes has reported to this section during the past two years will recognize the important relationship between his studies of the normal tissues, demonstrating the lymphatic channels in the peridental membrane, and Dr. Hatton's studies of the pathologic changes in this membrane. They corroborate each other, and both fit in with the most careful clinical observations of the progress of these infections. I would like to emphasize the difference, observed clinically, in the progressive destruction of tissue in the case of the pus pocket, beginning in the gingival line of the tooth, and of the chronic alveolar abscess, beginning at the apex of the root. In the one beginning at the gingival line we have noted the tendency to progress most rapidly toward the apex, forming a deep, narrow pocket, while in the alveolar abscess there has not been the same tendency to progress crownwise. Dr. G. V. Black referred to this as early as 1886, and in his recent book on Dental Pathology there is a paragraph calling attention to the fact that we must have a proper explanation of the difference in the progress of these two types of infection involving the same tissue. If the route of travel is by perivascular lymphatics, the clinical observations in both conditions are explained, because the flow of lymph is from the gingivae toward the apex, which would promote the progress of infection toward the apex in the case beginning as gingivitis and retard a similar progress crownwise in the case of the alveolar abscess.

The study of the movements of the ephithelium is very interesting, especially the apparent effort of the epithelium to line the pockets about the sides of the roots. It is possible that in a small percentage of cases pockets along the sides of the roots have been lined by epithelium, and the individuals have thereby been protected from systemic infection. In treating these cases by cutting away the tissues which overlie the

surface of the roots, there occurs a rapid growth of epithelium over the cut surface down to the line of attachment of the root. All of the studies of the tissue changes support this plan of treatment as being the most practical method of eliminating the menace to the general health.

DR. EUGENE S. TALBOT, Chicago: The most interesting part of this paper is the migration of the epithelial cells. These cells will migrate almost anywhere when they get started. The question naturally arises, How far will they extend into other tissues and how far will they extend down through the peridental membrane? My research of these subjects leads me to believe that very little work has been done on the migration of epithelial cells. I think Dr. Hatton will agree with me that it will be impossible for these cells to migrate through bony tissue. All his pictures showed that they are located in soft tissues, so we will have to set down as a fixed point that they cannot migrate through bony tissue.

The next question to settle is, How far will these epithelial cells migrate from the surface down into the soft tissues. My studies showed conclusively that the cells of the external epithelium do extend into the fibrous sac or peridental membrane, or far down to the ends of the roots of the teeth, before the bone begins to form. We have all seen epithelial cells in the peridental membrane at the root of the tooth. Another point that I did settle the other day conclusively and which has been attacked by eminent men is that these epithelial cells migrate into the fibrous sac from the external epithelium. Dr. Hatton and Dr. Black both mentioned the fact in regard to the lymphatics that these cells have a tendency to migrate downward. There is no question about that. In the last four or five years I have been doing extensive operations on dogs by using all the drugs that we use on our patients. You would be surprised to see the effects of these drugs and the absorption that has taken place by the use of a simple alkaline mouth wash by producing an irritation through the end of the root into these tissues, and I have many photographs which show this absorption and then the inflammation and abscess formation between the roots of the molars and also abscesses along the margin of the gum tissue. These experiments showed conclusively that by forcing an irritant through the end of the root an inflammation is set up and an abscess forms, not at the end of the root, but higher up between the roots of the molars and the gum margin.

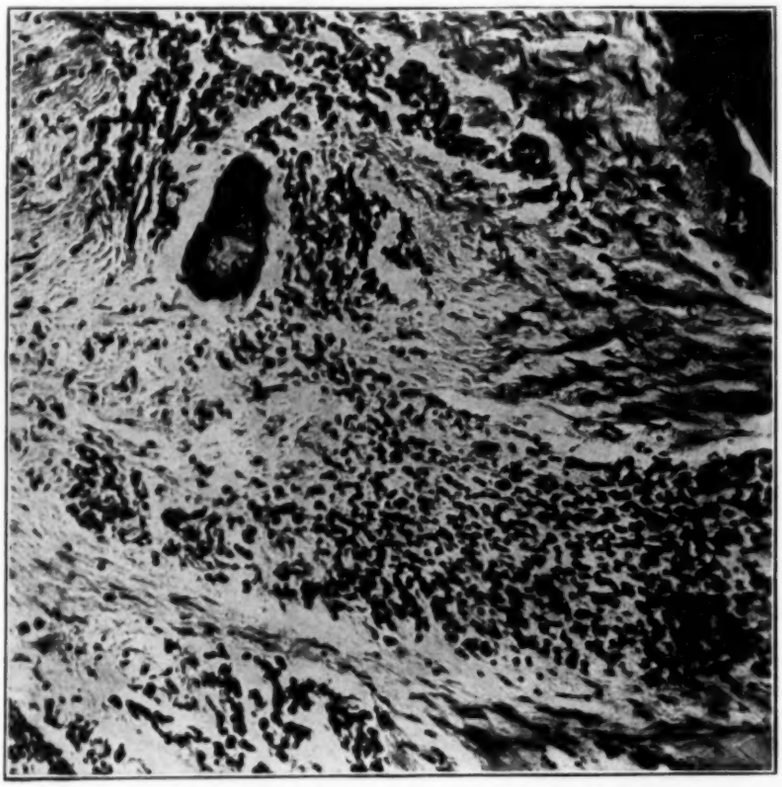


Fig. 4.—Perivascular round cell infiltration of the gingivae with destruction of the fibers of the peridental membrane.

DR. V. H. MOON, Indianapolis: One or two points of Dr. Hatton's presentation coincide with our experience in the pathology of other tissues; namely, the thinning out and disappearance of fibrous tissue in connection with an acute inflammatory reaction. This phenomenon is found elsewhere, and it may be explained as being due to a proteolytic ferment which is produced by the inflammatory cells, which have the function or capacity for absorbing fibrous tissue. So, in pus formation, where there is actual destruction of tissue, the liquefaction of the tissue is due, in part, to the proteolytic ferment produced by the cells which infiltrate that region.

As to the migration of epithelial cells, we have learned in other lines of pathology to be conservative in our statements for the reason that the wandering cells of the body, which are found in almost every tissue, so closely simulate epithelial cells in their characteristics that it is difficult to decide whether we are looking at an epithelial cell or at one of these wandering cells. These wandering cells are very common in regions which are subject to chronic infection.

Usually when the fibrous tissue is disappearing as a result of inflammatory reaction, hyaline degeneration occurs, the tissue taking a homogeneous, rather deep pink stain. I have not noticed change of staining to a basic character except occasionally in tuberculosis and syphilis. After the fusing together and hyaline degeneration of the fibers there is a subsequent liquefaction, and the liquefied tissue and inflammatory cells are carried off by the lymphatics.

I did not wish to be misunderstood as referring to the true proliferation of epithelium to cover a granulating wound surface, which is a regular occurrence on all surfaces that are covered by epithelium. What I referred to was the migration through the tissues of epithelial cells. Epithelial cells will grow very readily from an adjacent epithelial surface. It can be demonstrated in connective tissue cultures in the test tube that as the fibrous tissue proliferates and grows the epithelial cells which are in culture with it will grow and spread along the surface of those fibrous tissue cells. The same thing occurs in the healing of wounds or in any wounds or granulating surface adjacent to the epithelial covering.

DR. FREDERICK B. MOOREHEAD, Chicago: The differentiation between epithelial cells and epithelioid cells, as Dr. Moon has just suggested, is very important. The proliferation of epithelial cells in continuity, as seen in skin grafting and in the repair of surface wounds, is well illustrated in clinical surgery. I see no reason why the surface epithelium should not grow into the pockets, even to a considerable depth, in the cases Dr. Hatton cited. I believe it will be seen that it is more a question of proliferation by continuity than by cell migration that these spaces are lined by epithelium. In pyorrhea pockets, so called, where the infection has been controlled, the conditions of heat and moisture are present and there is also enough mechanical irritation to stimulate the proliferation of epithelial cells. Moreover, there is always a tendency of epithelial cells to repair and cover defects.

DR. EDWARD H. HATTON, Chicago: The possibility of the migration of epithelial cells has been explained by the other speakers. I believe that in all my specimens those projections are true epithelial cells, because I think that in every case, by means of serial paraffin sections, I am able to demonstrate that they are. I cannot say that I have found any true epithelial migration, except the growth into fluids.

OSTEOMA OF THE FRONTAL SINUS

W. W. BOARDMAN, M.D.
AND
MARY M. DONOVAN, M.D.
Associate Professor of Medicine and Assistant in Medicine, Respectively, Leland Stanford Junior University School of Medicine
SAN FRANCISCO

The occurrence of osteoma of the frontal sinus is relatively infrequent, as may be judged from the fact that Sewall,[1] after carefully reviewing the literature, found only ninety-two cases. In these cases the diagnosis was based on the presence of anatomic deformities secondary to the osteoma; in only a few had the roentgen ray been used to confirm the clinical impression, and in none had the condition been primarily diagnosed roentgenographically.

During the past six months the following two cases of clinically unsuspected osteoma of the frontal sinus have been discovered in the routine examination of skull plates.

CASE 1.—A man entered the Stanford University Medical School Hospital, complaining of very severe headaches of long duration. In the early stages these had been frontal, but of late they had been principally occipital. Diffuse brain tumor seemed to be the clinical diagnosis. However, lateral stereoscopic skull plates showed an abnormal area of density in the region of the frontal sinus. Examination of sinus plates showed a uniformly dense, sharply outlined shadow in the right frontal sinus. On these findings a diagnosis of osteoma of the frontal sinus was made. At operation a hard, bony tumor was found firmly wedged into the sinus. It was successfully removed and the patient has been completely relieved of all symptoms.

Fig. 1 (Case 1).—Anteroposterior view of osteoma of frontal sinus. The tumor occupies the right frontal sinus, although not completely filling it.

Fig. 2 (Case 2).—Lateral view of osteoma of frontal sinus. The tumor apparently does not quite fill the frontal sinus but extends downward into the ethmoid region. Its irregular shape is striking.

Fig. 3 (Case 2).—Anteroposterior view of same case. The tumor appears to involve one of the frontal sinuses more than the other. Its invasion of the ethmoid region shows plainly.

CASE 2.—A young man came complaining of convulsive attacks, simulating epilepsy, but with no objective deformities suggesting osteoma. Examination of plates of the skull showed a large, dense, irregular shadow occupying the frontal sinus region, extending downward into the ethmoid region and backward into the cranial vault. Operation again confirmed the diagnosis of osteoma of the frontal sinus, but the patient died of a complicating meningitis.

The lesson to be drawn from these cases is not that osteoma of the frontal sinus can be diagnosed by the roentgen ray—that is self-evident—but that roentgenographic study of all doubtful head cases should be made as a routine.[2]

1. Sewall, E. D.: Ann. Otol., Rhinol. and Laryngol., 1918, **27**, 275.
2. In addition to the reference already given, the following will be found of interest:
De Taranto, I. M.: Les osteomes de l'orbit, thèse de Paris, 1901.
Perthes, George: Arch. f. klin. Chir., 1904, **72**, 1022.

THE SPREADING POWER OF COAL OILS*

TORALD SOLLMANN, M.D.
CLEVELAND

P. N. Leech[1] and I[2] independently observed that the addition of a little asphalt to melted paraffin greatly lowered its surface tension toward water, so that a very much thinner and more even film than with pure paraffin is formed, and very much more rapidly. In reflecting on this phenomenon, it occurred to me that it might be utilized to secure rapid and extensive spreading of the oil in fighting mosquito larvae, thus increasing the efficiency and lowering the cost of the oil treatment.

Experiments showed that kerosene has a low spreading power, and that this is actually enormously increased by the addition of asphalt. If kerosene is dropped on a dish of water, it collects into rather small plaques, and spreads very slowly, if at all. If 0.1 per cent. or more of asphalt varnish ("B-asphaltum, Cleveland Window Glass Company") has been added, it spreads at once over the entire surface of the water.

Similar results were observed with gasoline.

However, unrefined oils generally spread perfectly without the addition of asphalt. They presumably already contain sufficient asphalt-like products.

The following crude oils spread perfectly without the addition of asphalt:

Pennsylvania Lower District Crude.
Light Tiona Crude.
Kansas-Oklahoma Crude.
Residue oil left after distillation of the lighter product.
A sample of "No. 4 Road Oil" did not spread.

SUMMARY

The "spreading power" of oils on water is important in their use against mosquito larvae. It should therefore be ascertained, at least by the rough test herein described.

The spreading power depends largely on the presence of asphalt-like products. Most crude oils contain these in sufficient quantity. Some, however, and especially refined oils, need the addition of asphalt. Kerosene requires about 0.1 per cent of asphalt varnish.

* From the Department of Pharmacology, Western Reserve University School of Medicine.
1. Leech, P. N.: "Ambrine" and Paraffin Films, THE JOURNAL A. M. A., May 19, 1917, p. 1497.
2. Sollmann, Torald: Suggested Formulas for Paraffin Films, THE JOURNAL A. M. A., April 7, 1917, p. 1037.

Clinical Notes, Suggestions, and New Instruments

BONE-HOLDING FORCEPS *

Robert Emmett Farr, M.D., Minneapolis

The multiplicity of bone forceps designed to overcome the displacement of bones is sufficient evidence that most of these devices have certain shortcomings. In order to meet the requirements, such a device must have sufficient strength, and adaptability to bones of different diameters. Its application should be simple and it should have means of overcoming displacements by manipulations.

The instrument herein described consists of two long bone-holding forceps which may be readily united to each other by a carriage and worm-drive arrangement which requires the forceps to be brought parallel to each other in one plane only. Once assembled, extension may be made by means of the worm drive, which is operated by means of a two-way reversible ratchet. Movement in one plane may then be accomplished by moving the handles of the forceps over the screw, which acts as a fulcrum. Movement in the lateral plane is achieved by means of a ratchet propelling the carriage on one stationary blade of the forceps. It will therefore be seen that once the device is assembled, displaced fragments of bone may be brought into any desired position by the manipulation of either of the ratchets or of the forceps handles. The bone-grasping end of the forceps is so designed as to allow their application to bones of any size and to leave free approximately one-third of the surface of the bone; these free surfaces lie in the field of operation so that transplants or other mechanical appliances may be used without the necessity of removing the forceps.

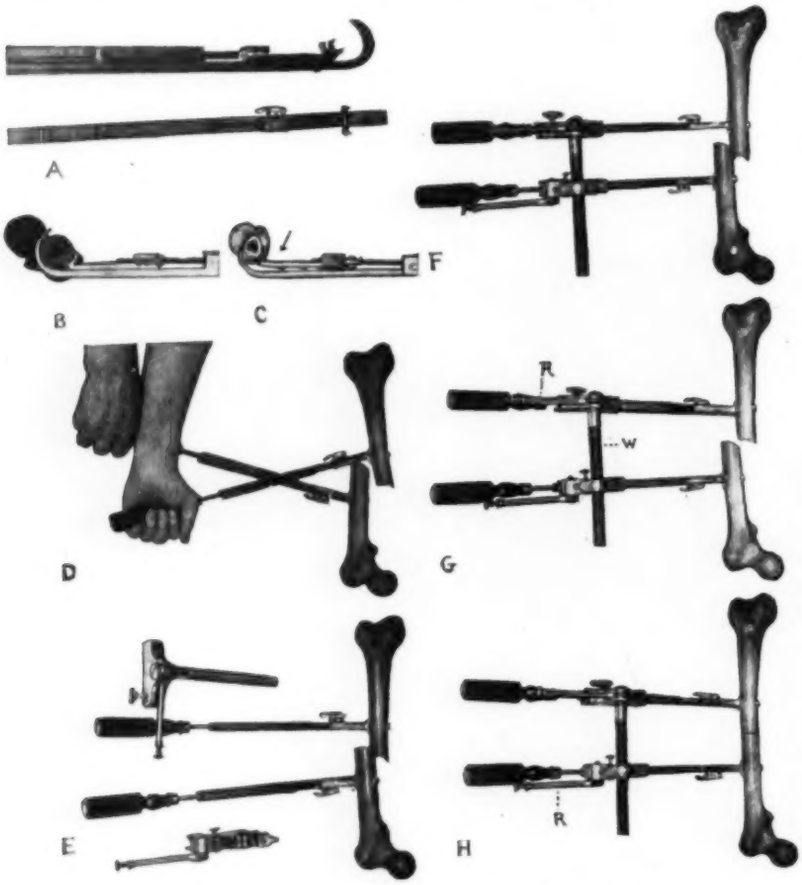


Fig. 1.—*A*, Bone-grasping parts of forceps; *B*, forceps grasping large bone (femur); *C*, forceps grasping small bone (ulna); note change in position of proximal grasping surface, bringing transplant area upward into field; *D*, forceps applied to femur before assembling; *E*, forceps parallel; worm drive, split nut and carriage ready for assembling; *F*, forceps assembled; *G*, extension applied by means of worm drive (*W*) propelled by ratchet (*R*); *H*, lateral displacement overcome by means of ratchet (*R*).

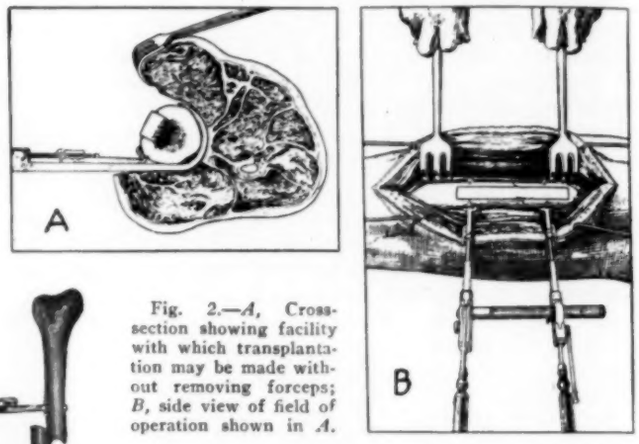


Fig. 2.—*A*, Cross-section showing facility with which transplantation may be made without removing forceps; *B*, side view of field of operation shown in *A*.

* Read before the Section on Orthopedic Surgery at the Sixty-Ninth Annual Session of the American Medical Association, Chicago, June, 1918.

A TONSIL EXPRESSOR

Julius H. Hess, M.D. (Chicago)
Major, M. R. C., U. S. Army
Fort Riley, Kan.

Examination of the teeth and tonsils in a large series of cases of endocarditis, rheumatism and chorea has demonstrated that many of the patients are suffering from alveolar abscesses and infected tonsils. The removal of such teeth is a simple matter even during the course of the disease, but only a few men have had the temerity to advise tonsillectomy at the height of the infection in acute cardiac conditions. Believing that much could be accomplished by evacuating the pus which has accumulated in the tonsils in many of these cases by expression and massage of the tonsils, I have devised an instrument which has been found of practical value in our cardiovascular and rheumatic wards for diagnostic purposes and frequently for treatment.

Set at right angles to a 7½-inch steel handle is a cross-piece of steel three-quarters inch in length and three-sixteenths inch in diameter, well rounded on all its surfaces and highly polished. The crosspiece has an anterior-posterior curvature of three-sixteenths inch and a curvature of one thirty-second inch on its upper surface.

The instrument is used by passing it in at the angle of the mouth opposite to the tonsils to be expressed and by applying it first at the superior angle of the fossa external to the pillars and pressing upward and outward. In this way the superior pole of the tonsils is exposed and expressed. The remainder of the tonsil can then be exposed by anchoring the instrument by one arm and massaging the tonsils from above downward with the other arm, which is made possible by the concave upper surface of the instrument. At all times the instrument should be kept in front of the anterior pillar.

Tonsil expressor.

The advantages of the instrument are that: (1) it offers a simple means of exposing the entire tonsil for diagnostic purposes; (2) it can be used to advantage in expressing pus from the tonsils for bacteriologic examination; (3) the tonsils can be evacuated without an anesthetic without pain to the patient two or three times a week, and the patients rarely object to the repetition of the treatment. In very sensitive throats a 2 per cent. solution of cocain may be used before treatment.

In many cases one or more large pus pockets are present. The most frequent seat of the pus pockets in our cases has been near the upper pole between the anterior pillar and the tonsil. This part of the tonsil is often completely buried behind the pillar and cannot be exposed by simple retraction of the pillar.

Massage and expression of the tonsil in no sense replaces tonsillectomy. It is recommended only as an emergency measure where the radical operation is contraindicated during the height of an infection.

ACCIDENTAL INJECTION OF BILE DUCTS WITH PETROLATUM AND BISMUTH PASTE

ADOLPH REICH, M.D., NEW YORK

Miss J. de M. had a pelvic operation two years before consulting me. A few days after the operation she was taken with pain over the region of the liver, and a swelling, which appeared in the midaxillary line, was incised and discharged pus, leaving a persistent fistula between the tenth and eleventh ribs. She asked to be relieved of this fistula.

In order to know the direction of this fistula, I injected about 2 ounces of petrolatum paste and bismuth with a melting

Fig. 1.—Postero-anterior view, showing bile ducts filled with paste down to the duodenum.

point of 110 F. Immediately there was considerable pain in the pit of the stomach, the following day the patient's temperature was 102 by mouth, the urine was dark brown, she was jaundiced, and she could not hold anything on her stomach. Figure 1 shows the bile ducts filled with the paste down to the duodenum.

The treatment consisted of local hot applications, morphin for the pain, calcined magnesia one-half ounce every two hours until the bowels moved freely, and injection of warm olive oil through the fistula, about 1 ounce or more every three hours. The next morning the bowel movements had a dark slate color and kept so for two weeks, and the temperature

Fig. 2.—Anteroposterior view taken recently; bile ducts free from bismuth; a few grains of bismuth near the opening of the fistula.

fell to normal withjn one week, and all symptoms of the obstructive jaundice passed off gradually.

Figure 2, taken recently, shows the bile ducts entirely free from bismuth and only a few scattered grains of bismuth near the opening of the fistula. Pus is discharged only occasionally, and some of the bismuth finds its way out.

245 West Twenty-Fourth Street.

STUDIES OF ROENTGENOGRAMS OF THE ACCESSORY NASAL SINUSES

WITH A DESCRIPTION OF A NEW METHOD OF TAKING SUCH PICTURES: PRELIMINARY NOTE

MAX UNGER, M.D., NEW YORK

In common with other nose and throat specialists, I have felt the disappointment resulting from the lack of help in diagnosis furnished by roentgenograms of the accessory nasal sinuses, especially in cases of suspected ethmoid and sphenoid disease.

The method now employed in the taking of roentgenograms of the accessory nasal sinuses is to put the plate in front of the patient's face and to shoot the roentgen ray through from the back of the head. This gives us an excellent picture of the frontal and maxillary sinuses, but the recognition of the ethmoids and sphenoids is a matter of guesswork. This is due to the fact that the latter cells are small, deeply situated and overlapped by the frontal and maxillary sinuses, the turbinates and the nasal bones.

Accordingly, I have devised a new method of taking roentgenograms of the sinuses. I employ a roentgen-ray film that is cut to the shape and size shown in Figure 1. This film is wrapped in waterproof paper, similarly to dental films. A

piece of card-board is included next the emulsion side of the film for purposes of protection and ease in handling.

When a picture is to be taken the film is inserted into the subject's mouth, the narrow end touching the posterior pharyngeal wall and the broad end projecting from the mouth. The roentgen-ray tube is adjusted above the head so that the rays pass directly downward and at right angles to

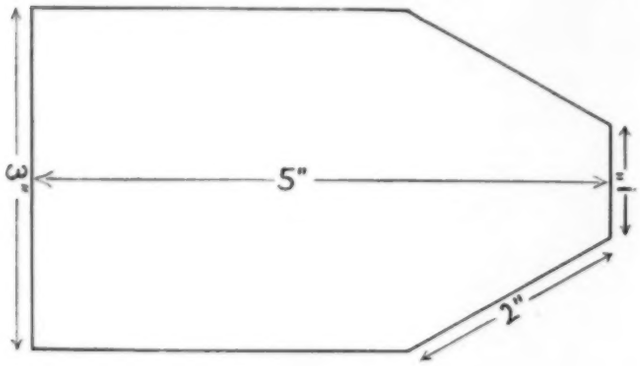


Fig. 1.—Shape of film.

the film. Sometimes a slightly obtuse angle forward is necessary, especially when the film cannot be pushed back completely. Sometimes, also, cocainization of the throat is necessary to overcome gagging.

This method has the advantage that the pictures show all four accessory nasal sinuses in isolated positions, without any overlapping. The ethmoids and sphenoids are shown best, but the frontal and maxillary sinuses are also shown in their horizontal dimensions, knowledge of great value when operations on these sinuses are contemplated. The maxillary sinuses are also shown in their relations to the teeth.

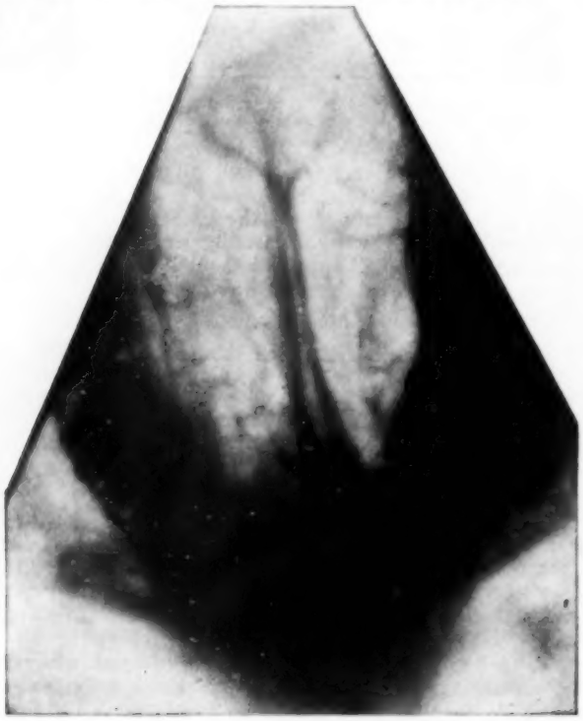


Fig. 2.—Sphenoid at apex; ethmoidal cells in center; antrum around last two teeth on left.

The method should prove of value in the investigation of fractures and the location of foreign bodies, such as bullets, at the anterior part of the base of the skull.

This is a preliminary report and deals only with the use of this method on the cadaver. A later communication will deal with its use on the living.

253 West Forty-Second Street.

AN AUTOMATIC DISTRIBUTOR FOR NEUTRAL SOLUTION OF CHLORINATED SODA (DAKIN'S SOLUTION)

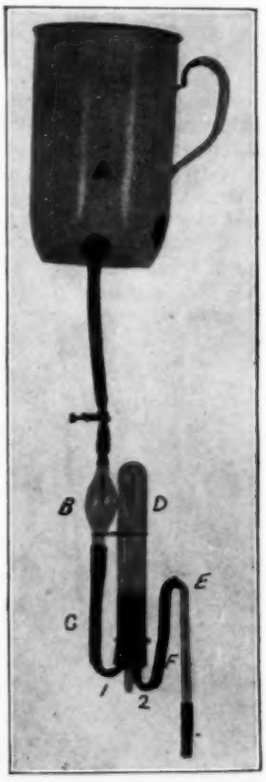
LYMAN J. STRONG, M.D., BUFFALO

The successful use of Dakin's solution (neutral solution of chlorinated soda) depends on its delivery in sufficient quantity to all parts of the infected wound at regular and frequent intervals. These conditions can be obtained by a simple apparatus.

Wounds vary in size; therefore, this apparatus has two controls, one for time and one for quantity.

An irrigator can, *A*, is elevated on the head of the bed. A short piece of rubber tubing connects with a drop tube, *B*. A screw clamp on this piece of tubing controls the rate of flow through the dripping apparatus. For example, to deliver 80 c.c. every two hours, the screw clamp is set so that 10 drops each minute fall from the drop tube.

A large size test tube, *D*, of about 100 c.c. capacity, is fitted with a three hole rubber stopper. This test tube serves as a reservoir to collect the solution from the drop tube. Through one hole of the stopper a piece of glass tubing, placed so that it extends the entire length of the test tube, controls the pressure in the test tube when emptying and filling. Through the other two holes of the stopper are pieces of glass tubing bent in short-armed U's. U Tube 1 and U Tube 2 convey, respectively, Dakin's solution into and out of the test tube.



Automatic distributor for neutral solution of chlorinated soda.

U Tube 1 is connected with the outflow from the drop tube by a rubber tube, *C*. U Tube 2 is connected with U Tube E, which has one long arm and one short arm. This is done by a piece of rubber tubing, *F*, to the short arm. This rubber tubing should be long enough for U Tube E to be elevated or lowered a distance equal to the length of the test tube. Raising U Tube E increases the quantity of fluid discharged into the wound. For example, to deliver 80 c.c. every two hours, the drip is set at 10 drops per minute. U Tube E is set three-quarters up the test tube.

The long arm of U Tube E connects with regularly used Dakin's tubes that are planted in the infected wound.

As fluid runs from the can through the drop tube; it is conveyed by Tube C into the test tube, which stops it from flowing into the wound until it reaches the level of U Tube E. When it reaches this level a siphon is formed, and the quantity of fluid in the test tube is expelled at one time into the wound.

This apparatus is practical and has discharged fluid at intervals of one minute and intervals of two hours with the regularity of a good clock. The quantity may be varied from 5 to 100 c.c. It can be made in any hospital or laboratory. It depends entirely on gravity, so that it always works.

482 Williams Street.

Conditions Demanding Blood Transfusion.—Positive indications in chronic anemia will be found in the case records (prolonged suppuration, infection and fever, and in sluggish wound healing), in the information derived from repeated blood counts, hemoglobin estimations, and blood pressure determinations.—*Review of War Medicine and Surgery.*

Military Medicine and Surgery

RAPID METHOD FOR DETECTION OF OVA OF INTESTINAL PARASITES IN HUMAN STOOLS

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The military significance of infection by hookworm disease among recruits and troops of the United States Army might be inferred from its known clinical symptoms. That it is characterized by anemia, edema, intestinal disturbances and by a disinclination to physical effort is well known. Testimony and statistics add to these charges the facts that morbidity and mortality tend to be higher among troops from the area of hookworm infection than among those from outside that area. Comparisons of the records of examinations of new recruits from the hookworm area[1] reveal the fact that white men with this infection make lower records than do the noninfected, literate and illiterate. There is also some evidence that hookworm infections tend to impede the progress of recruits in discipline and instruction. The guard house, venereal isolation camp and the hospital show higher rates of infection than does the camp as a whole. Hookworm disease appears to be one of the causes tending to increase the ratio of noninfectives among our troops and to lower the standard of their efficiency.

Because of the numbers to be examined, the nature of the available equipment and the desirability of not encroaching on the duties of a medical staff already occupied with more important work, it was essential that any method used in detecting this infection should be rapid, accurate, simple, adapted to the utilization of a changing personnel in large part, and that it should not require elaborate apparatus or extensive laboratory equipment.

COMPARISON OF VARIOUS METHODS

The direct microscopic examination of a small sample of the fecal specimen is inaccurate because of the minuteness of the sample used, and impracticable because of the length of time required to make a fair examination. The greater efficacy of the brine flotation-loop method in the detection of worm ova as compared with the ordinary smear method is shown in the accompanying table, in which nine-day periods are compared. The salt flotation method is obviously inferior in the detection of *Strongyloides*.

Only hospital cases, based on records at Camp Jackson, are included in the table. The great variability in the daily hookworm precentages is probably due to the varying proportions of patients from the Northern states.

The centrifuge method is at once precluded by the difficulty, if not impossibility, of securing an adequate number of instruments to accomplish a work of such magnitude, and the added difficulty of securing the requisite tubes and other glassware essential to equip and maintain facilities adequate to care for the number of examinations to be made. It also calls for extraordinary care in cleaning the glassware used, for hookworm eggs are quite adhesive to the surface of glass. This is a difficulty of considerable importance when laboratory helpers are inexperienced, and adds much to the burden of supervision.

The centrifuge is also inaccurate, probably because of the small size of the samples used. The standard fecal sample collected for this method in the Army is contained in a 2-dram vial. Negatives for hookworm by this method as used by the senior author in the Department Laboratory of the Southern Department were examined by the salt flotation method by us and found in about fifty examinations to show a 40 per cent. increase in infections. That is, the percentage was increased from 10 to 14. This was borne out by the fact that, whereas the percentage of infection by the centrifuge method was about 8 per cent. in 7,000 examinations, it rose to from 14 to 20 per cent. among troops from the same general localities when the salt flotation method was applied.

COMPARATIVE RESULTS IN DETECTION OF OVA

1918 June	Ordinary Smear Method: Number Examined.	Positive Hookworm.	Percentage Positive.	Remarks.
10	205	13	6.3	During nine-day period
11	132	23	17.7	the same total of examina-
12	153	24	15.7	tions as that of the hook-
13	135	19	14.1	worm gave the percentages:
14	150	11	7.3	Ascaris 1.1
15	116	9	7.7	Hymenolepis nana 0.6
17	144	3	2.1	Trichuris 0.3
18	106	14	13.2	Strongyloides 0.6
19	99	11	11.1	Oxyuris 0.0
	1,240	127	10.2	
	Brine Flotation-Loop Method			
20	109	40	37.5	During nine-day period
21	96	34	35.4	the same total of examina-
22	146	50	32.1	tions as that of hookworm
24	146	48	34.1	gave the percentages:
25	152	39	26.2	Ascaris 1.1
26	128	26	20.3	Hymenolepis 0.8
27	120	26	21.7	Trichuris 0.8
28	120	22	18.3	Oxyuris 0.08
29	116	25	21.6	Strongyloides 0.0
	1,133	310	27.1	

The elaborate sieve-sedimentation method of Hall[2] is not adequate to the military necessities because of the fact that it can be operated only in a well-equipped laboratory and requires an expensive, elaborate and somewhat permanent installation. It seems not to be rapid, and would require great care in cleaning to prevent a carrying on of infection, when the sieves are used in rapidly succeeding examinations. Its accuracy in cases of light infections should also be tested.

The culture method of Looss[3] and of Fülleborn[4] has been used by the senior author in the laboratory of the California State Board of Health. This is an exceedingly accurate method, revealing the lightest of infections. But it requires regulated incubators to run to a schedule of operations, constant supervision and inspection, a delay of about five days before results can be reported, and considerable washing of glassware, including, when paper Petri dishes are used for culture, the centrifuge tube (possibly omitted), Syracuse dish and a pipet. The active larvae make the detection of infections quickly decisive in the case of positives. Skill in differentiating *Strongyloides* larvae from those of hookworm is essential. The use of culture mediums and water free from free-living earth and water nematodes is also a desirable pre-

1. By Capt. P. F. Pittenger of the psychologic board at Camp Travis.

2. Hall, M. C.: Jour. Lab. and Clin. Med., 1917, **2**, 347.
3. Looss: Egypt, Min. Educ., Rec. School Med., 1905, **3**.
4. Fülleborn: Arch. f. Schiffs- u. Trop. Hyg., 1911, **15**, 363.

caution. This method is thus not readily adapted to military conditions by reason of the installation required, the amount of cleaning and the precautions necessary. The delay incident to the hatching period so extends the time between collection of the sample and report of the results as greatly to increase the material on hand under supervision, and the bulk of the clerical work awaiting completion. No opportunity has been afforded to compare it in detail with the brine flotation-loop method as to their relative accuracy in detecting light infections. The culture method detects hookworm and *Strongyloides*, both with free-living stage, but does not give any clue to the presence of the cestodes, and of *Ascaris*, *Trichuris* and *Oxyuris*.

THE BRINE FLOTATION-LOOP METHOD

In view of the difficulties attending the use of the methods enumerated above, under Army conditions, the method here described was devised after considerable experimentation. The senior author in his work on hookworm in the gold mines of California for the California State Board of Health had adopted the culture method after prolonged experimentation with the centrifuge method and unsuccessful attempts to find a satisfactory sedimentation, flotation or filtration method that would effectively utilize a large sample and detect light infections. The junior author had had long experience in Malaysia, China and the Fiji Islands with the International Health Board in the critical use of various methods of examination, especially that of the centrifuge, under field conditions.

The method finally perfected by us may be designated as the brine flotation-loop method. It consists in mixing a large fecal sample thoroughly in concentrated brine, in a paraffined paper can of from 2 to 3 ounces capacity, forcing the coarse float below the surface by means of a disk of No. 0 steel wool, and then allowing the can to stand one hour for the ova to ascend. The surface film is then looped off with wire loops, one-half inch in diameter, and examined on a slide without a cover glass.

The method has been tested in the Southern Department under the senior author's direction in more than 100,000 examinations of varying ratios and degrees of infection by about seventy-five different examiners, under diverse field conditions, and has been found to be efficient and practicable.

TECHNIC

The stools for examination are collected at reveille in the morning at the company latrines by a collecting squad consisting of sixteen enlisted men in charge of a sergeant and under command of a medical officer. The men from a given company are in charge of a line officer. They are marched to the latrine in alphabetical order and the roll is called from the roster by the sergeant in charge of the men. On admission to the latrine each man is identified and given a container, bearing the designation of the organization and his roster number, a sheet of waterproof paper, and half a tongue depressor as a collecting stick. He is instructed to defecate on the paper and to fill the can one third full of feces. Men unable to furnish a specimen are given salts, under the supervision of the medical officer, and are moderately exercised. The men submit their sample to the collector for inspection on leaving the latrine to prevent the passing in of empty cans. Substitution is forbidden. In practice, this squad can collect the specimens from an entire regiment, make the first delivery at the laboratory at 7:30 a. m., and complete the collections at 10 a. m. On an average from 3 to 10 per cent. of the organization on a complete roster fail to furnish specimens by reason of absence, detached service or failure to defecate.

The receptacles used as containers for fecal specimens for examination for ova of intestinal parasites serve not only to receive the fecal specimens at the latrines but also as the mixing dishes from which the ova are subsequently looped for examination, and themselves bear the results of their examination to the recorder's table. The use of glass or tin containers is precluded by the cost, labor of cleaning and danger of carrying over of infection by adhesion of ova to the sides of the dish. We have therefore used paper and pasteboard containers, which may be wasted after use. We have in emergency used paraffined paper drinking cups and standard hospital sputum cups, but have found the most satisfactory container to be the standard 2-ounce paraffined paper drug cans with tin bottom and paper top. Similar cans with paper bottom and top are more liable to be unsealed by the solvent action of the contents. Open drinking cups permit evaporation and increase the odor and liability of carrying over of ova by flies. Heavy paraffined "Kleen Kup" tumbler-shaped containers are satisfactory for shipping specimens some distance.

These cans are about 1½ inches in diameter and 2½ inches high and are made up from specially constructed paper tubing made from stock paraffined on the inner face. Their capacity is normally 2 ounces and varies from 50 to 80 c.c. according to the brand or factory. Certain brands either have no coating or are so lightly coated that it was necessary to treat them to a dipping or to an inside coating of hot paraffin or sodium silicate to render them brine-proof. Paraffin-coated brine-proof cans that will resist soaking up by brine and feces for a number of hours can be obtained from commercial sources at present and are fairly satisfactory for this method of stool examination. The practical advantage of containers of these dimensions is that they will rack snugly in the compartments of the pasteboard fillers which hold three dozen each, of standard shipping cases for eggs, which hold thirty dozen each. To facilitate the handling of a single filler we have used specially constructed pasteboard trays with tape loops for handles into which a single filler fits. These trays are very convenient for use in the preliminary marking of the cans, the arrangement of the numbered cans and for subsequent handling at the latrines and in the laboratory.

In the examination of troops in the Army, each can is marked with the designation of the organization and the roster number of the man whose specimen it is to receive. Thus, 305 Cav. H-16 is for the sixteenth name on the roster of Troop H of the Three Hundred and Fifth Cavalry. Cans were at first marked on both top and side: the former for convenience in picking out a particular can at the latrine, the latter for use in the laboratory. These cans were marked with wax pencils or on strips of adhesive tape in ink on the tin tops, and the sides similarly marked or with lead or colored pencil or in ink. Pasted typewritten labels are unsatisfactory, as they may soak off if wet or peel away if dry. The most satisfactory labeling thus far found is that written in "Eternal" ink. This is not removed by water or brine, and sinks into the paper so deeply that it cannot be rubbed off. It is also clearly visible on the wet can. The cans for a given organization, such as a company of a regiment, are serially numbered, and on receipt at the laboratory from the latrine are usually not in numerical order. In order to detect shortages, eliminate confusion of indistinctly written numbers, and facilitate entering results on the numerically and alphabetically serial roster, the cans are first arranged in numerical order on a number board and then racked in order in the sockets of serially numbered wooden racks holding ten cans each. They are then passed to the mixing table where they are prepared for the examiners.

The stool is prepared for examination by stirring the specimen thoroughly in concentrated brine with a small wooden stick until the brine is considerably discolored and the contained ova released from the feces. The amount of stool to be stirred varies with its consistency and composition. Not more than one third of a canful is ordinarily used; if the sample submitted is too generous, the amount is reduced. The can is filled nearly full with brine, and the stool, if putty-like and resistant, is broken up against the sides of the can.

In some instances of putty-like stools the release of the ova is facilitated by scouring the stool up with steel wool on the end of the stick, against the side of the can. After stirring until the desired consistency is attained, the stick is withdrawn and a circular filter of No. 0 or No. 1 long fiber steel wool is carefully pushed down through the fluid to the bottom of the can with the stick. This effectively removes from the surface the lighter coarser float, breaks up the air bubbles, and leaves the surface clear of coarse particles and suitable for looping of the floating ova. Stirring the stool with the electric soda mixer gives quickly a suspension of the stool, but forms too many air bubbles for satisfactory looping.

If too much wool is used it will interfere with the ascent of the ova. If too little is used it will not remove the float. As a rule a lightly compressed disk, one-eighth to one-fourth inch in thickness, is sufficient. From 1 to 2 pounds are sufficient for 1,000 specimens. Other materials, such as disks of wire netting, excelsior and southern moss will serve the same purpose, but less successfully by far. The southern moss may introduce fresh water nematodes and their eggs and larvae.

Since there is danger of contamination of adjacent cans through stirring and in putting in the wool by splashing over from one can to another, it is a wise precaution to remove the can from the rack during the preparation. As an additional precaution to prevent the accidental transfer of a stick from one can to another during the mixing of a rack of cans, it is customary to place sticks in all of the cans and leave them there when not in use until the entire rack is finished.

The specimen is prepared for microscopic examination by looping off the surface film to an ordinary glass slide. The loops for this operation are prepared from unraveled window screen or similar fine galvanized wire. They can be made up rapidly from 6-inch squares of wire netting by twisting the individual wires into the loops. Each loop is formed around a glass tube or wooden cylinder about one-half inch in diameter, the shorter end twisted around the longer, which forms the shaft to close the loop, which is then bent out at right angles to the shaft. The surface film will usually adhere to the wire when the submerged loop is lifted from the brine. Ova in the film are removed with it. It has been found advisable to loop the surface near the sides as well as the center of the can. For this purpose the loop may be molded to the arc of the can on one side.

The number of loopfuls necessary to make a fair sample for microscopic examination depends on the capacity of the film removed. About ten loopfuls will skim the entire surface of the can and form a pool of brine conveniently handled on an ordinary microscope slide with a mechanical stage. One skimming does not by any means remove all the ova, as they are not all in the immediate surface. If ova are present in any numbers they may be obtained at once, if the stirring has been thoroughly done. It is customary for the cans to stand for one hour to allow the ova to accumulate in the upper layers. Ova may still be found at the surface after twenty-four hours, but their numbers are decreased. In warm weather they may have entirely descended in five hours.

The following test shows the relative hourly abundance of hookworm ova in the surface film on a can mixed with brine at 8:45 a. m., until they disappeared:

The brine and ova were poured off into another can at 9:15, being distributed, by the pouring, throughout the fluid. Four loopfuls were placed on the slide and ten fields were examined. At 9:15 a. m. there were 69 ova recorded; at 10:20, 169; at 11:20, 150; at 1 p. m., 85; at 2:10, 20; at 3:15, only 3, and at 4 p. m. none. The temperature during the period was from 90 to 95. The maximum number of ova appeared at the surface about an hour after they were uniformly stirred, and seven hours after mixing, all had descended from the surface.

From tests made under other conditions it is evident that there is considerable variation in the rate of ascent and descent of the ova in the brine in different stools and at different temperatures.

For a time we marked off an ellipse 1½ inches by ¾ on the slide with a wax pencil to assist in confining the pool of brine on the slide, but this was later abandoned as unnecessary.

In the cases of viscid, opaque and fatty stools, considerable dilution may be required. This may be done with a few drops of a mixture of equal parts of glycerin and brine stirred into the pool on the slide. The glycerin clears the more opaque particles and renders the ova more easily visible.

The following modification of the salt flotation-loop method has been used by the junior author at Camp Jackson, S. C., for routine hospital examinations and for a limited number of stools sent from the camp:

Specimens are sent into the laboratory in tin containers provided with lids. Salt flotation and loops are used exactly as in the method describe below, but instead of filtration by steel wool the coarser floating particles are skimmed off by means of a spoon before the ova have time to rise. The spoon is scrubbed with a brush and carefully washed under the hot water tap after each use. When cans are used a second time they are very carefully cleaned and dried.

It is obvious that the sole advantage of this modification is in the saving of materials. Further, it is adapted only to work on a comparatively small scale and in a laboratory supplied with skilled workers and with a hot water tap for the proper cleaning of utensils. It is not to be recommended for field work on a large scale or for any work in which pasteboard containers and steel wool are obtainable.

COMMENT

Contamination of adjacent cans by droplets of the surface film splashing over from an infected can to a negative one may readily occur when the loop catches on a stray fiber of the steel wool and is suddenly released, or when the film in the loop breaks on contact with the slide. For this reason the can and slide should be moved away from the rack while the pool is being looped off. The viscosity of the surface film may vary greatly with the nature of the stool. It is markedly decreased by slight additions of such disinfectants as tricresol and phenol (carbolic acid) or by alcohol, which is useful in removing air bubbles from the surface. Formaldehyd solution tends to curdle the mixture, and delays the ascent of the ova and reduces the numbers in the surface film.

These variables, which affect the opacity and contents of the loop and the number of ova it removes, render any uniformity of looping and resulting thoroughness of examination practically impossible. In practice from three to seven loopfuls are generally used; but the number in the course of numerous examinations will vary from one to twenty. It is obvious that these variables will introduce a margin of error in the detection of ova only among the lighter infections.

The ova of parasites such as *Ancylostoma duodenale, Necator americanus, Ascaris lumbricoides, Oxyuris vermicularis, Trichuris trichiuria, Taenia saginata, Taenia solium, Hymenolepis nana, Hymenolepis diminuta,* and *Dipylidium caninum* and of trematodes are floated up by the brine into the surface layer of the pool without distortion or noticeable change in appearance during the usual period of examination. Cysts of *Endameba coli* and *histolytica* and of *Giardia intestinalis* are also floated up. Since the ova are at the surface, it is not advisable or necessary to use a cover glass.

The surface of the pool of brine is thoroughly searched with the aid of the mechanical stage. To reduce the amount of focusing, the convexity of the surface of the pool may be reduced by spreading it over the slide and extending the amplitude of the movements of the mechanical stage.

The microscopic equipment most useful is the typical high grade instrument with 16 and 4 mm. objectives and × 5 or 6.4 and × 10 oculars or their equivalents. The searching is done with the low power objective and low power ocular since the latter is less tiring in long-continued examinations. For closer scrutiny the 4 mm. objective may be used with care on objects in the surface film without cover glass.

To render the ova more distinctly visible it is essential that the microscope be provided with a substage condenser and that the illumination be reduced by closing the iris diaphragm or lowering the condenser so as to increase the sharpness of definition of all objects in the field and to bring the egg membranes into relief. This assists in the quick differentiation of ova from objects of similar shape and opacity. The amount of searching necessary to make a fair examination is a function of so many variables that no arbitrary rule can be laid down. The degree of dilution, stirring, flotation, the amount of the surface fluid in the pool, its extent and convexity, the consistency and opacity of the fluid and its solid contents, the nature and number of the particles floated to the surface, the number and size of air bubbles, fat cells, oil globules and starch cells, all combine to complicate the search for ova. It is advisable to search a considerable area rapidly, and especially in the case of opaque fluid and confusing particles, to search a part of the area minutely or make an additional dilution. Experienced examiners on an average give from two to three minutes to the examination of a specimen containing on an average four to five loopfuls spread over an area of approximately a square inch on the slide.

Infected stools, or positives, are usually detected in the first field or first run across the slide examined. In a test case of 550 positives of hookworm, most of them very light infections in Oklahoma and Texas recruits, detected on five consecutive days by five experienced examiners and recorded as found or not in the first run across the slide, there were 180, or 30.5 per cent., reported as seen in the first run. Infections obviously reduce the time required for examination in most cases. In a relatively few cases, estimated at not more than 5 per cent. in our experience with the examination of more than 100,000 men in the Southern Department (Texas, Oklahoma, New Mexico and Arizona), several ova only have been found in the whole slide examined. In rare instances only a single ovum is found. These very light infections and the negatives require more time for a complete examination than do other positives.

It is obvious that the rate of examination and daily score of the examiner will be in part a function of the ratio of positives to the whole and of the average degree of infection. With numerous positives and heavy infections, which are usually coincident, the rate of the expert examiner may easily be doubled over that when positives are few and infections are light. The experience, skill, industry and thoroughness of the examiner are also factors determining his daily score, as well as the nature of the stools as conditioned by diet and modified by the skill or lack of it on the part of the mixers.

A skilled examiner will complete from 150 to 250 examinations daily under average conditions. With the assistance of a looper the rate can be speeded up to one per minute; but the resulting eye strain renders this inadvisable as a daily routine. A staff of fifteen examiners can maintain a rate of from 2,000 to 2,500 examinations daily and attain 3,000 under favorable conditions of cooperation and effective supervision of the mixers. A staff of twenty examiners can complete a full regiment daily. Supplemental aid of approximately one man in the field collecting squad and one man in the laboratory and clerical squad for each examiner is necessary to collect, prepare, record and dispose of the specimens and attend to the policing of the laboratory.

The time required for the physician inexperienced in laboratory work to become efficient in this method is brief. Enlisted men with some experience in college, university or Army laboratories acquire a reliable degree of accuracy with several days' training and supervision, as shown by test, and may in some instances also acquire the speed of an experienced examiner in this time.

In our experience after experimenting with various methods of making records of the results of the examinations we have finally adopted the roster system with special recorders whose only duty is to make the record on the primary roster. Efforts to make a card system were futile, for even with experienced examiners, entries are sometimes omitted or incorrectly made. The difficulty arises from the constant intermittence of the two distinct types of work, microscopic and clerical.

For his own information and for the quick ascertainment of the day's totals and percentages, each examiner keeps a daily score on which is entered the serial number of each rack of specimens examined, the number of cans examined, negatives, hookworm, tapeworm, etc. The totals are quickly cast up, transferred to another sheet and the grand total arrived at.

The results of the examination of the individual cans are indicated by certain conventional signs. A negative can carries only the loop. Positive hookworm is indicated by the inserted slide, dwarf tapeworm (*Hymenolepis nana*) by a mixing stick, and any other infection by the written name on a slip of cardboard. When thus designated the rack is passed to the recorder's table who enters the results on the rosters, using red for hookworm, blue for all other infections, and lead pencil for negatives. Since the cans are arranged in numerical order within the racks, the entries on the roster fall consecutively in variously ordered groups of ten, and the recording proceeds rapidly. The arrangements of the cans in serial order and the entry of the results in sequence tend to eliminate errors arising from misplaced entries and indistinct numbers.

A rubber stamp is used to allocate on the roster a tabulated summary of the results within an organization such as a company or regiment. It provides for entries of infections by hookworm, *Hymenolepis nana*, a blank for writing in the rarer infections, negatives, no specimen, absent, number examined, and total on the roster. Additional spaces provide for revisions as follow-up specimens come in later.

This system reduces the clerical work to a minimum and makes possible the reporting in at the close of the day of the lists of the infected men for treatment. When the work of an organization is closed, the duplicate roster with all the infections and unexamined men indicated thereon is returned to the regimental surgeon and the triplicate similarly marked, to the division, district or camp sanitary inspector, and the primary roster remains as the permanent record for filing with the officer in charge of the hookworm survey.

The accuracy of this method depends on a number of variables, the size and consistence of the specimen, the thoroughness of stirring, the proper amount of steel wool, the care in looping, the opacity of the fluid, and the extent and thoroughness of search made of the material on the slide. Much depends on keeping the focus directly on the surface of the fluid during examination and in training the eye to detect quickly every object resembling an ovum.

The cases of infection which escape detection are the very light ones in which only a few ova can be found on a slide. Some slides prepared from such infections may have no ova, or the ova may be hidden or overlooked.

Reexamination of slides and cans that are reported by an experienced examiner as negative will sometives reveal a positive lightly infected. Men reported as negative on a first examination may appear as positive on a second specimen and vice versa. This raises the question as to the uniformity of distribution of the ova in the stool and as to the possibility of internal states of host and of parasite influencing the rate of deposition of ova in successive stools.

With a view of testing out the possibility of light infections having been overlooked, a test was made on 100 negatives from colored troops at Camp Travis. Infections in the battalions from whom these negatives were drawn were only sixty-eight in 1,495, or 4.8 per cent. The infections were also light, as a rule. The top fluid of fifty cans was drawn off into a tall cylindric liter graduate and the surface film of this column examined. The cans had stood after stirring for less than three hours, and no brine from thick or viscous stools was used, so as to avoid entangling any ova that might be present. This was repeated on a second fifty and the top fluid of the two lots combined in a slender 50 c.c. graduate. An examination of the surface film of each of these concentrations gave negative results. A subsequent examination within two hours of flotation of 150 negatives by the same method from white troops, showing 219 positives or 8.7 per cent. in 2,505 examinations, revealed one case of ova in one lot of fifty. The other two lots remained negative. In another test of three lots of fifty each from white and colored troops showing 110 infections, or 5.7 per cent., in 1,914 examinations, all remained negative. Thus, in a total of 400 negatives, or eight lots of fifty, of light and therefore presumably easily overlooked infections, only one lot showed evidence of an undetected infection on this test.

It appears from these tests that the number of positives escaping detection by the brine flotation-loop method is small. These tests were made in the negatives from sixteen examiners, eight of whom had had only from three to nine days' experience with hookworm examinations.

No opportunity has occurred for a comparison of this flotation method with the culture method to compare their relative accuracy on identical stools.

ADVANTAGES OF THE METHOD

The great advantage of the brine flotation-loop method lies primarily in the easy utilization of large samples. With large enough containers, receptacles for mixing the entire stool may be utilized, thus eliminating entirely the element of random sampling, except as this may appear in irregular ovoposition or unequal discharge in successive stools. This insures a sufficient number of ova to make detection possible in light infections which other methods, using smaller samples, may fail to detect in a larger proportion of examinations. The method is for this reason a more accurate one.

The method is also a simple one, requiring only the simplest laboratory equipment, aside from the microscope, using available commercial materials and utilizing unskilled labor in large part for its aids. This facilitates the mobility of field operations far from base laboratories, since a permanent staff only for supervision and training is necessary.

It is also more rapid, being in our experience about 50 per cent. more rapid than the centrifuge method. It is also more rapid than the culture method, in the experience of the senior author, since the time required in the mixing, inspection, watering, concentrating, examining the cultures and in cleaning the pipets and Syracuse dishes is easily double that consumed in the flotation method. This is increased if glass Petri dishes are used for culture instead of paraffined paper ones, which may be wasted.

The flotation method also almost wholly eliminates the labor of cleaning apparatus and containers. The only pieces of apparatus to be cleaned are the wire loops from negative cans which may be salved by washing en masse and drying thoroughly, the glass slides, which are rinsed and wiped, and the racks, which are occasionally washed with brush and hose. The container, which serves also as mixing can, the stick and the steel wool are wasted. There is no cover glass or centrifuge tube to be cleaned.

COST

With the exception of the microscope, the use of which is common to all methods, all apparatus and materials used are inexpensive commercial articles. Aside from the microscopes, tables and stools and office fittings, the equipment necessary for handling 2,500 daily costs about $120. The materials necessary for 1,000 examinations in addition to the containers are 1,000 sheets of buckskin paper, 10 by 15 inches, 500 tongue depressors, 35 pounds of salt, from 1 to 2 pounds of No. 0 steel wool, and a certain amount of wastage on loops and slides. The cost in the Army for the salaries and commutation of the officers and pay and subsistence of the men required to make 2,500 examinations daily in a given instance is 6.2 cents per examination, a total of 7.7 cents. There is also expense for office supplies, some clerical work in the preparation of rosters, and of fuel for incineration, which will increase this amount to about 8 cents per examination. Costs of transportation and other overhead charges not included above will also slightly increase this amount according to the varying circumstances attending the survey. If allowance is made for slack time and reductions in rate of supply of specimens incident to Army conditions, the cost will be materially increased. The estimates given are based on optimal conditions and full capacity.

Another advantage accruing from the simplicity of the method and the nature of the materials used lies in the fact that nontechnical labor may be utilized to a large degree, and competent persons accustomed to the use of the microscope may very quickly become efficient examiners. This renders its use on a large scale in military or industrial establishments or in preventive social sanitation both practicable and possible with a relatively small staff of specially trained persons for supervision and administration.

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PANDEMIC INFLUENZA AND PNEUMONIA IN A LARGE CIVIL HOSPITAL*

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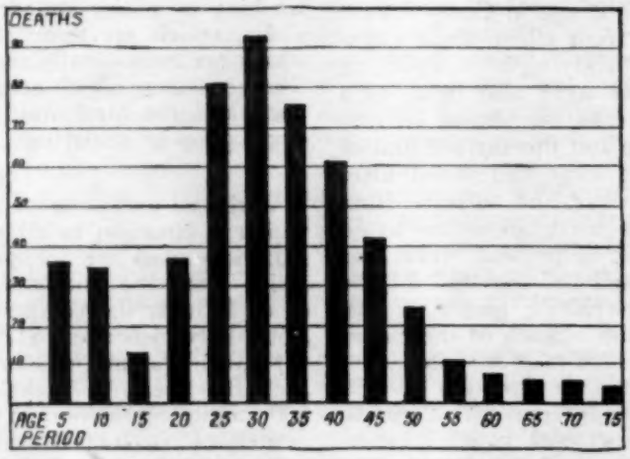
Following the reports of a rapidly spreading and highly fatal pandemic of influenza and pneumonia in the Eastern States, and while the epidemic of influenza was raging at the Great Lakes Naval Training Station, a severe outbreak of this disease appeared among the civil population of Chicago. During the past five weeks, from September 23 to October 29, more than 2,000 patients were admitted to the wards of Cook County Hospital. Of these, 642 died, a mortality of 31 per cent. In the accompanying chart, of the first 500 deaths, it will be noted that the age period of highest mortality falls between 25 and 30 years.

Among the total number of admissions during this period there were 122 soldiers, and thus far twenty-one cases have terminated fatally—a mortality of 16 per cent. So far as the admissions to a large charity institution, such as the Cook County Hospital, may be regarded as an index to the prevalence of the recent epidemic in Chicago, it appears that the disease is now definitely on the decline. Accordingly, it seems pertinent to report the results of an intensive study conducted during the past five weeks in the morgue and the laboratory of the Cook County Hospital.



Age period of highest mortality in the first 500 deaths. The ordinates represent the ages in five year periods, the abscissas the total number of deaths per period. It will be noted that the period of highest mortality is between 25 and 30 years.

CLINICAL PICTURE

The incubation period varied from a few hours to one or two days. Shortly after the arrival of the first fifty soldiers, five of the nurses in attendance on these patients became violently ill, and during the following two weeks more than fifty nurses and twelve of the resident physicians contracted the disease. Three of the nurses died. Blood cultures, nasopharyngeal and tonsil swabs and cultures of the washed bronchial secretion were immediately taken by the laboratory staff, and four of the laboratory assistants were suddenly taken ill within the next forty-eight hours.

The onset is sudden, with complaint of severe headache, dull, aching pains in the muscles and joints, general weakness and quite commonly dull pains in the lumbar region. Conjunctivitis is not infrequent in the initial stages. Sore throat is unusual. The patient takes to bed with chilly sensations, and the fever rises rapidly from 101 to 104 F. Early prostration is the rule. Epistaxis occurs in a considerable number of patients, in one person as much as a pint of bright red blood gushing from the nostrils. The pulse is accelerated and the respirations vary from 20 to 36 a minute. The second to the fourth day marks the critical period for the average patient. Remissions may occur, but among our cases more frequently following the crisis the temperature rises rapidly again and a slight bronchial cough develops, productive of small amounts of thick yellow or yellowish brown sputum teeming with gram-positive encapsulated pneumococci. There can be no doubt that the bronchial secretions are highly infectious at this time and that the disease is transmitted by personal contact and by droplet infection occasioned by coughing and sneezing.

Moreover, very early after the onset, careful physical examination of the patient's chest will often reveal scattered râles with areas of consolidation over the lower lobes and especially the right lower lobe. The bronchopneumonic process begins as an intense acute hemorrhagic tracheobronchitis, rapidly extending to the finer bronchioles of the lung. In the acute fulminating cases the patients become markedly cyanosed, and death results from an asphyxiative bronchiolitis with large quantities of frothy blood-tinged fluid exuding from the mouth and nostrils.

In the more protracted cases, particularly in civilian patients, the bronchopneumonia extends gradually to the left lower, and right middle and upper lobes, and clinical evidence of a severe toxemia manifests itself. Blood counts taken early after the onset of the initial symptoms exhibit a striking leukopenia as low as 1,800 per cubic millimeter and averaging from 3,000 to 4,000 per cubic millimeter. With the onset of the pneumonia a definite leukocytosis quite commonly appears. The urine shows traces of albumin with hyaline and granular casts. Blood cultures taken early and late in the course of the disease and inoculated into glucose broth and plated in blood agar have remained uniformly sterile in forty-two instances.

MORBID ANATOMY

Of the first forty postmortem examinations made on the bodies of persons dying both early and late of bronchopneumonia, it was possible to obtain cultures from the nasopharynx, tonsils, washed selected bronchial sputum and from the lung parenchyma. Cultures were also obtained from these sites before death. The first eight necropsies were all of acute fulminating cases in young soldiers of excellent muscular development and physique. The course of the disease ranged from three to five days. Death was preceded by marked cyanosis and clinical evidence of acute asphyxiative bronchiolitis.

At necropsy the pleural cavities contained blood-tinged fluids remarkably free from fibrin content and varying from 300 to 1,000 c.c. in amount. The pleura of the lungs was fibrin free and regularly the seat of petechial and confluent hemorrhages. On cutting transversely across the trachea to reflect the viscera from the thoracic cavity, large quantities of blood-

* From the Laboratory of Pathology of the Cook County Hospital.

tinged, frothy fluid exuded from the air passages. The lining of the trachea and main bronchi presented a deep purplish red, and this intense inflammatory condition extended downward into the finest bronchioles. The consolidation was always lobular in type and involved most frequently the lower lobes, less often the entire midde and lower half of the right upper lobes. Marginal compensatory emphysema presented itself with striking regularity. The peribronchial lymph glands were acutely swollen and edematous. Cut surfaces of the lung presented a mottled, firm, granular appearance with intervening areas of dark red aerated lung tissue. Large quantities of bloody serum bathed the smooth, fibrin-free cut surfaces of the lung. The right heart was acutely dilated, in two instances the tricuspid valve ring measuring 13 and 14 cm., respectively, from cut edge to cut edge. In another body, bilateral symmetrical hemorrhage of rather huge dimensions was present in the tissues of the fatty capsules of both kidneys. The liver and kidneys were heavier than normal and the seat of fatty changes and parenchymatous degeneration. Passive hyperemia of the pia-arachnoidal vessels over the cerebral cortex, and edema of the leptomeninges were not uncommon. We desire to emphasize the fact that the amount of consolidated lung parenchyma was small as compared to the pneumonic consolidation quite regularly present in the more protracted cases among civilians. It will be noted that *B. influenzae* was isolated from only three of the lungs at necropsy in these eight early cases, in one instance in practically pure culture.

In the more protracted cases among civilians the bronchopneumonic process presents a rather uniform bluish gray hue with the cut surface bathed in grayish yellow pus—a massive, confluent, pseudolobar pneumonia. Fibrin is frequently present over the pleura of the lower lobes of the lungs. In only one case was an empyema present. The hemolytic streptococcus was isolated in pure culture and identified in direct smears from the pus.

BACTERIOLOGIC FINDINGS

A careful detailed bacteriologic study of the prevailing epidemic, especially among the civilian population, forms the basis of this paper. Bacteriologic reports of the pandemic in Europe show that the influenza bacillus was found only exceptionally while pneumococci, streptococci and *Micrococcus catarrhalis* were recovered with considerable regularity from the sputum, nose and throat cultures. In Germany a circular letter addressed to the leading bacteriologists requesting the results of their laboratory investigations brought forth the following replies[1]: "Pfeiffer had not examined a sufficient number of cases at Breslau, but found his bacillus in some while failing to recover it from others, and was still investigating the causes of this discrepancy." Gruber in Munich and Friedmann in Berlin failed to find the influenza bacillus, and report streptococci and pneumococci as the common agents of the complicating pneumonias. Kolle in Frankfort failed to find *B. influenzae* in any of the cases which he had thoroughly examined.

Among the English observers, Gotch and Wittingham[2] isolated *Micrococcus catarrhalis*, with which they claim to have produced the disease in man. Little, Garofalo and Williams[3] found a gram-positive coccus which they believe to be the etiologic agent of the disease. From the Eastern States Keegan[4] in Massachusetts and Park[5] in New York have isolated the influenza bacillus in a high percentage of cases. These reports concern soldiers and sailors chiefly. Our study was made principally of the civilian population.

During the present epidemic in Chicago, more than 3,000 blood agar plate cultures have been made from swabs of the nasopharynx, tonsils and washed selected bronchial sputum and from the viscera and body fluids at necropsy in search for the influenza bacillus or other micro-organisms of possible etiologic significance. Blood agar plate cultures were made from the swabs of the nasopharynx and tonsils in more than 100 patients approximately equally divided into early and late cases. The washed bronchial secretions from the same patients were both plated and streaked on the surface of blood agar plates. Control cultures from the nose and throats of normal individuals were also made. In both groups a peculiar gram-positive coccus growing in grayish white colonies and exhibiting marked pleomorphism in stained smears was present with considerable frequency. The smaller coccal bodies passed Mandler filters in two instances. This coccus was nonpathogenic both for man and the ordinary laboratory animals.

TABLE 1.—PERCENTAGE INCIDENCE OF VARIOUS BACTERIA ISOLATED FROM THE SPUTUM, NASOPHARYNX AND TONSILS IN 100 CASES OF INFLUENZA

	Pneumococcus %	B. Influenzae %	Streptococcus Hemolyticus %	Staphylococcus %	Micrococcus Catarrhalis %	B. Mucosus-Capsulatus %	Miscellaneous
Washed bronchial sputum..	70	4	20	40	5	1	Diphtheroids 1%
Nasopharynx	58	0	4	65	5	1	Leptothrix 2% Meningococcus 2% Diphtheroids 1%
Tonsil.....	74	0	37	37	7	1	Diphtheroids 1%

In Table 1 is shown the percentage incidence of the various organisms isolated from the nose, throat and sputum of 100 patients. The influenza bacillus was recovered in four cases from the washed sputum—in three instances in predominating cultures, but always in symbiosis with staphylococci. It was not present in the nose or throat swabs. The predominating organism was the pneumococcus isolated from the washed sputum in 70 per cent. and from the throat in 74 per cent. of the cases. *Streptococcus hemolyticus* occurred in the washed sputum in 20 per cent., or twenty patients.

To determine how early and with what frequency the various bacteria invade the lungs, a series of lung punctures was made both before and after clinical evidence of pneumonia presented itself. A sterile needle attached to a glass syringe was passed through the intercostal spaces into the lung parenchyma, and lung tissue plus serum was aspirated sufficient to streak the surfaces of blood agar plates at the bedside. In addition, some of the aspirated material was inoculated into poured blood agar plates in each instance. Of thirty-six consecutive lung punctures taken during life, twenty-one were sterile. Eleven yielded the results given in Table 2. Thus the pneumococcus was present

1. Quoted from Bacteriology of the "Spanish Influenza," Lancet, London, 1918, **2**, 177.
2. Gotch, O. H., and Wittingham, H. E.: Brit. Med. Jour., 1918, **2**, 82.
3. Little, T. H.; Garofalo, C. J., and Williams, P. A.: Lancet, London, 1918, **2**, 34.
4. Keegan, J. J.: The Prevailing Pandemic of Influenza, The Journal A. M. A., Sept. 28, 1918, p. 1051.
5. Park, W. H.: New York Med. Jour., 1918, **108**, 621.

in pure culture in 72.6 per cent.; hemolytic streptococcus in 19.8 per cent., and *Micrococcus catarrhalis* in 6.6 per cent.

Table 3 gives the findings in cultures of the lung tissue streaked and plated on blood agar at necropsy. *B. influenzae* was isolated in three cases, or 8.7 per cent., in one instance in practically pure culture from both lungs. Again the predominating organism was the pneumococcus, occurring in 75 per cent. of the lungs at necropsy, from ten cases in pure culture, eleven times in predominating culture and in five instances in mixed culture. Of the various types of pneumococci recovered, Type II was present in 30.5 per cent. of the lungs, and Type IV in 50 per cent.

TABLE 2.—LUNG PUNCTURES DURING LIFE*

	No. of Cases	Per Cent.
Pneumococcus, Type I	1	6.6
Pneumococcus, Type II	2	13.2
Pneumococcus, Type III	3	19.8
Pneumococcus, Type IV	5	33.0
Hemolytic streptococcus	3	19.8
Micrococcus catarrhalis	1	6.6

* Incidence of the various bacteria isolated from fifteen lung punctures during life. Pneumococci predominated in pure culture in eleven cases, a total of 72.6 per cent.

TABLE 3.—LUNG CULTURES AT NECROPSY*

	No. of Cases	Per Cent.
Pneumococcus, Type I	2	7.6
Pneumococcus, Type II	8	30.5
Pneumococcus, Type III	3	11.5
Pneumococcus, Type IV	13	50.0
Influenza bacillus	3	8.7
Hemolytic streptococcus	15	43.0
Staphylococcus	18	40.0
Micrococcus catarrhalis	0	0.0

* Incidence of the various bacteria isolated from thirty-four lung cultures at necropsy. Pneumococci were recovered in pure culture in twenty-six patients, a total of 75 per cent.

TABLE 4.—NUMBER OF INSTANCES THE VARIOUS BACTERIA WERE ISOLATED FROM THE TISSUES AND BODY FLUIDS IN THE FIRST THIRTY-SIX NECROPSIES

	Pneumococcus	B. Influenzae	Streptococcus Hemolyticus	Micrococcus Catarrhalis	Staphylococcus
Heart's blood	7	0	8	0	0
Pleural fluid	15	0	8	0	2
Pericardial fluid	8	0	8	0	0
Tracheal mucosa	19	1	14	1	15
Lung	26	3	15	1	18
Spinal fluid	2	0	1	0	3
Peritoneal fluid	0	0	1	0	0
Middle ear	3	0	1	0	0
Frontal sinus	1	0	1	0	0
Spleen	0	0	3	0	4

The various strains of pneumococci were identified by morphology, cultural reactions, inulin fermenting properties, bile solubility and, finally, biologically with immune serums. Pneumococcus, Type IV, and allied green producing organisms were found to vary greatly both as regards bile solubility and inulin fermentation. Subsequent study of this heterogeneous group may extend it to include numerous strains of *Streptococcus viridans*. Hemolytic streptococci appear as late secondary invaders and were isolated from 43 per cent. of the lungs at necropsy. Staphylococci were frequently present.

THE INFLUENZA BACILLUS

It is evident from the tables that the influenza bacillus was isolated in only a relatively small percentage of the cases. Thus *B. influenzae* was present in four washed sputums—three times in predominating cultures growing typically as transparent minute colonies in symbiosis with staphylococci. It was recovered in one instance from the tracheal mucosa and three times from the lung cultures at necropsy. Influenza bacilli were never isolated from the lung punctures during life taken by preference from the early cases. On the other hand, the bacilli were recovered both in smears and in practically pure cultures from each lung in the case of a young soldier dying the fifth day of the disease. It appears that the Pfeiffer bacilli may have been the cause of the pneumonia in this case. In contrast to this single case we have not been able to isolate the bacillus in any considerable percentage of the civilian patients either during life or from acute fulminating cases at necropsy. The early results indicate that the technic employed should have sufficed to recover the organism if it were present in any considerable number of patients.

Furthermore, the high percentage of pneumococci obtained during life and at necropsy and predominating in the sputum, tracheal mucosa and lung tissue both early and late in the course of the disease suggest that this organism is at least the most important secondary invader and is responsible for many of the rapidly fatal pneumonias. It may be that we are dealing with a highly virulent strain of pneumococci sufficient in themselves to produce a rapidly fatal lobular pneumonia.

EXPERIMENTAL

Early in the course of our investigations we were impressed with the paucity of the bacteria in the nasopharynx at the onset of the disease and the marked degree of prostration exhibited in many of the patients. The possibility of a filtrable virus as the cause of the disease suggested the following experiments:

Experiment 1.—Oct. 2, 1918, the nose and throat of a patient having a typical case of influenza of forty-eight hours' duration was washed with 40 c.c. of sterile physiologic sodium chlorid solution, and the collected washings were diluted to a total bulk of 60 c.c. and shaken for twenty minutes in a sterile bottle containing glass beads. The fluid was immediately filtered through two small tested Mandler filters of medium porosity. The clear Filtrate A was inoculated into the anterior nares of three volunteers in amounts varying from 0.5 to 1 c.c. in each nostril. One of the men thus inoculated complained of slight headache, and presented a moderate conjunctivitis and a temperature of 99 F. twenty-four hours after the inoculation. These symptoms rapidly disappeared, and no further symptoms developed in any of the three subjects.

Experiment 2.—Oct. 4, 1918, the nasopharyngeal washings in two typical cases of influenza were mixed together and agitated in a sterile bottle containing glass beads for a period of fifteen minutes. The first patient had been ill only ten hours while the second patient was in the fifth day of the disease. The mixture of washings was immediately passed through a Mandler filter as Filtrate A and a second smaller portion filtered through a small Berkefeld candle N as Filtrate B. Filtrate A was inoculated into the anterior nares of two volunteers, and Filtrate B was similarly inoculated into the noses of two additional volunteers. One of the four subjects complained of a slight headache and presented himself twenty-four hours after the experiment with a definite coryza, conjunctivitis and lacrimation. These symptoms had completely disappeared by the following morning, and the men had all remained well when seen two weeks later. Cultures of the clear filtrates were inoculated into glucose broth and in the anaerobic tissue ascitic fluid culture medium of Noguchi. All tubes remained sterile after the expiration of two weeks. From these observations, which confirm those recently reported by Keegan, it may be assumed that the etiologic agent is not filtrable.

Experiment 3.—Oct. 4, 1918, at 4 p. m., the trachea and main bronchi secured at necropsy from a patient dying on the fifth day of the disease was split parallel to its lumen and the swollen dark red mucosa curetted off and thoroughly ground up with sterile sand in a mortar to make a turbid

suspension in 50 c.c. of sterile saline solution. The suspension was centrifuged at slow speed to throw down the gross particles, and half of the resulting red emulsion was passed through a Mandler diatomaceous earth candle of 12 pounds positive pressure. A *Macacus rhesus* monkey received 5 c.c. of the unfiltered suspension in each nostril, and 20 c.c. of the clear filtrate were injected at the same time very slowly intravenously. No symptoms developed.

EXPERIMENT 4.—Oct. 8, 1918, the monkey received 2 c.c. of the mixture of the nasopharyngeal washings in four early cases of influenza in each nostril after previous swabbing and washing out the protective mucus in the nares. No symptoms developed after seven days' observation.

COMPLICATIONS AND SEQUELAE

During the past five weeks of the present epidemic there were eighty-six pregnant women admitted to the obstetric wards of the hospital affected with influenza or pneumonia. Of this number twenty-one died shortly after miscarriage. Twenty additional deaths occurred before miscarriage could result, and forty-five patients recovered with or without miscarriage. The total maternal mortality has been 45.5 per cent.

Among other complications of the disease, eleven patients have developed a unilateral or bilateral purulent otitis media. Pure cultures of pneumococci were isolated from eight discharging ears, the hemolytic streptococcus in two patients and the *Streptococcus viridans* in the remaining case. One child developed an acute and fatal mastoiditis. Purulent frontal sinusitis was encountered in one instance at necropsy, and cultures yielded pure hemolytic streptococci. It is to be expected that sequelae of still more diverse nature may subsequently develop.

SUMMARY

A severe and rapidly spreading epidemic of influenza and bronchopneumonia first appeared at the Cook County Hospital, September 23. During the past five weeks more than 2,000 patients were admitted to the hospital. The disease is highly contagious, and the mortality among our patients has totaled 31 per cent. The epidemic has seriously crippled the medical and more especially the nursing staff of the hospital. More than fifty of the nurses and twelve of the physicians have contracted the disease, three deaths occurring among the total number.

The influenza bacillus was isolated in only 8.7 per cent. of the total cases and chiefly from a small number of soldiers. In one instance it appears that the influenza bacillus may have caused the fatal bronchonpneumonia. Influenza bacilli were isolated only exceptionally from the civilian patients. Pneumococci were the predominating organisms in the sputum, throat cultures and in the lung cultures both during life and at necropsy. Pneumococci of unusual virulence were the most important early secondary invaders, and have sufficed to cause many of the fatal pneumonias.

Experiments indicate that the disease is apparently not due to a filtrable virus.

Liability for Performing Unauthorized Postmortem Examination.—It is held in the Minnesota case of *Woods* v. *Graham*, 167 N. W. 113, annotated in L. R. A. 1918 D, 403, to be no defense to an action to recover damages caused by a necropsy performed on the body of the daughter of plaintiff, without the consent of the next of kin, that defendant, as the attending physician, was unable to ascertain the cause of death and performed the necropsy for that purpose, so as to be able to give a certificate, as required by law, stating the cause of death.—*Legal Notes.*

INCORRECTNESS OF THE DIAGNOSIS OF DEATH FROM INFLUENZA

PRESENCE OF BRONCHOPNEUMONIA IN PRACTICALLY ALL PERSONS SEVERELY ILL WITH INFLUENZA *

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Boards of health, as indicated by newspaper reports, very generally are subdividing their mortality reports from epidemic influenza into deaths from influenza and deaths from pneumonia or bronchopneumonia. This is no doubt based on the death certificate return handed in by the physician in charge of the patient. Is it a correct return? In my opinion it is not. The correct return should be bronchopneumonia and (epidemic) influenza. Whether the bronchopneumonia is part of the influenza or is a complication of that disease; whether the disease is due primarily to the influenza bacillus; whether the pulmonary consolidation is caused primarily by the *Bacillus influenzae* or is the result of concomitant bacteria are questions that cannot be answered on the basis of our present information. However, my own observations on patients suffering from epidemic influenza do justify a vigorous protest against a statistical subdivision of death reports into those dying from influenza without pneumonia and those dying from bronchopneumonia or pneumonia and influenza.

My reasons for believing that in practically all fatal cases of epidemic influenza there is a pneumonic process in the lungs before death are as follows:

1. In 126 consecutive fatal cases of epidemic influenza observed by me and my assistants at the Peter Bent Brigham Hospital, not a single patient failed to show physical signs justifying a clinical antemortem diagnosis of bronchopneumonia.

2. In twenty-two consecutive necropsies at the Peter Bent Brigham Hospital in fatal cases of this group, no single case failed to show pathologic changes in the lung justifying the diagnosis on the part of the pathologist of bronchopneumonia.

3. In patients submitted to necropsy, pulmonary changes are as a rule more extensive than physical signs during life had indicated.

4. Clinical study of nonfatal cases of epidemic influenza justify the belief that with very few exceptions, patients with fairly severe to severe cases have bronchopneumonia.

In making the foregoing statements I do not deny that influenza patients may die from an overwhelming toxemia without pulmonary involvement or from influenzal meningitis or encephalitis or from some other manifestations of the disease. Such fatal cases did not occur at the Peter Bent Brigham Hospital, and in conversation with my colleagues who have had postmortem experience in this disease I have found that their views have seemed to coincide with those expressed here by me. In our admissions to the hospital of patients sent in with the diagnosis of influenza, I have seen cases of meningitis; one case was due to the meningococcus and apparently did not have any com-

* From the Medical Clinic of the Peter Bent Brigham Hospital.

plicating influenza; two patients were tuberculous and may have had influenza, and two cases were due to the pneumococcus in influenza patients with pneumonia. Several patients with influenza and having signs and symptoms suggestive of meningitis showed spinal fluids with normal cell counts and negative cultures. No spinal fluids in our cases showed *B. influenzae*.

The statement made under No. 4 is based on these facts. In 195 unselected cases[1] of epidemic influenza studied in the wards of the Peter Bent Brigham Hospital, 132 showed during their period of observation in the hospital sufficient physical signs to justify the clinical diagnosis of bronchopneumonia. The 132 include practically all severely ill patients and many who were only mildly ill. The only patients in whom the temperature was as high as 101 for more than three days in this series in which no diagnosis of bronchopneumonia was made were fourteen in number. Two of these had complicating otitis media, and one was an asthmatic with chronic bronchitis antedating influenza; eight were patients admitted on the day of their first symptoms, two on the third day of their disease, and one on the fourth day. Of these last eleven patients, none were more than mildly ill, and they appeared to be free of any complications.

The physical signs on which was based the diagnosis of bronchopneumonia were areas of bronchial breathing or consonating râles, usually both, frequently bronchophony and often dulness on percussion. The occurrence of any one of these signs in a localized area appears to justify the diagnosis of bronchopneumonia. In a number of our patients, roentgen-ray examinations were made and invariably showed evidence of consolidation where these physical signs had been observed. Moreover, the roentgen plate as a rule showed more extensive areas of consolidation than clinical signs indicated; and not infrequently it showed consolidation before we had felt justified in diagnosing it on the basis of physical signs. The peculiar snapping consonating quality of the râle in epidemic influenza seems of great significance as indicating consolidation. All who have been listening to the chest in influenza patients will, I am sure, recognize what I mean, though my word picture of the quality of the sound is very inadequate.

The early foci of consolidation in influenza are found almost invariably in the region of the angle of the scapula and the interscapular regions. Here the roentgen ray shows that consolidation begins, i. e., toward the inner lower border of the lung posteriorly rather than anteriorly. From such an early beginning, rapid spread often takes place, leading to very extensive diffuse consolidation and not infrequently giving the clinical picture of a lobar pneumonia, though I believe true lobar pneumonia is really rare in association with influenza.

If the busy clinician—and never were our medical men so overwhelmed with work as in this epidemic—will percuss rapidly the lower lobes in the back and listen in the region of the angle of the scapulae and next in the interscapular regions he will find quickly in most severe cases evidence justifying him in diagnosing bronchopneumonia. Of course, in many cases further examination will yield evidence of much more extensive pneumonic involvement.

I should not be justified in making the extreme statement that all patients with epidemic influenza have bronchopneumonia. Many milder cases certainly give no physical signs of consolidation, and the roentgen ray shows no shadow sufficient to justify the diagnosis of a focus of consolidation. I believe, however, that we are justified in regarding epidemic influenza as a disease involving the respiratory tract and except in the milder cases causing a clinically demonstrable bronchitis and bronchopneumonia in the larger proportion of cases. That as the severity and duration of the disease increases the percentage of patients with bronchopneumonia increases, and that in fatal cases almost without exception bronchopneumonia is present, are conclusions which seem fully justified by the data here presented. A corollary to this is that, in my opinion, it is quite incorrect to consider fatalities in this epidemic as due to influenza uncomplicated by bronchopneumonia except in such exceptional cases as to form a negligible factor in statistical reports of death returns.

1. This represents only those patients discharged and having their histories completed and filed in the record room to date. The total of our cases, about 500 in number, will show somewhat the same rates.

AN EPIDEMIC OF INFLUENZA AT MANILA, P. I.*

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During the month of June, 1918, an epidemic of influenza appeared in the Philippine Islands which presented a number of interesting manifestations. At the time I was in charge of St. Luke's, one of the most popular hospitals in Manila, and will attempt to summarize my notes and records during that period. About 300 cases, the majority of which were hospital patients, came under direct observation.

The epidemic, so far as can be determined, began in Manila, although the fact that cases were first noted among longshoremen and other laborers along the waterfront might indicate that it had been brought in from some other part of the world. On the other hand, the statements of Castellani and Chalmers and others that pandemics of influenza have usually started in the Far East further the belief that this epidemic originated here. All of the reports and rumors of influenza occurring elsewhere—in other parts of the Philippine Archipelago, in Japan, Vladivostok, Spain, etc.—that have come to my attention have placed their outbreaks at later dates than the one at Manila, with one exception: Between thirty and forty cases of influenza, with at least one death, occurred on a United States Army transport which left San Francisco shortly before the epidemic appeared in Manila, and arrived here after it was practically over. The Filipino cabin-boys and mess attendants were the most seriously affected on board the transport, although several first-class passengers were also ill.

While the disease in the Manila epidemic affected all classes and races, it was most severe among the Filipinos, less so among the Chinese and Japanese, and still less among the Europeans and Americans. As there was no attempt at isolation, the infection spread rapidly. Within three days after the first cases were noticed, between 70 and 80 per cent. of the longshore-

* The observations on which this note is based were made under the auspices of the International Health Board of the Rockefeller Foundation.

men, clerks and other workers at the docks were unable to work, with the result that several of the transpacific vessels were delayed in sailing. In two days more, the epidemic had reached the business and residence sections of the city. In one large business firm, 80 per cent. of the native employees were away from work for at least two days, while 50 per cent. of the Europeans were absent for one day. The majority of the business concerns were similarly incapacitated. Two of the newspapers were so crippled that publication was suspended for a day, and the telephone company asked the indulgence of the public for its poor service, explaining that 90 per cent. of its force was suffering from the epidemic.

St. Luke's Hospital, with a normal capacity of seventy patients, accommodated between ninety and ninety-six for several days, the largest number admitted in its history. The work necessitated by this increase was accomplished with great difficulty, as one third of the nursing staff and one half of the orderlies and attendants were ill.

Within ten days after the initial outbreak the great majority of those who had been ill were well enough to be back at work, and business and industrial activities resumed their normal course. However, the hospital continued to be overcrowded with cases diagnosed as influenza for two or three weeks more, and it was not until the advent of a typhoon, which brought with it a great deal of wind and rain, that the last vestiges of the disease were swept away. During the epidemic there was no apparent decrease in the number of admissions to the hospital for other diseases.

Clinically, most of the cases ran the typical course of influenza as described in textbooks, namely, sharp onset, usually with sore throat or upper respiratory tract symptoms, sudden high fever, and headache, with aching and stiffness all over the body. A pronouncedly slow pulse rate, in proportion to the temperature, was remarked to be the rule. This slow pulse, and the absence of a skin rash, together with the lightning-like spread of the epidemic, served to differentiate the disease from dengue fever, the only closely similar condition. The highest temperature recorded was 106.2 F. The patient with this high fever did not suffer, however, nearly as much as many others, and it appeared that the severity of the attack did not depend on the temperature. The majority of the patients also withstood the pain very well, as is the usual thing among these peoples, but the toxemia developed was so great that it made those who were most severely stricken practically collapse. The faces of the patients as a whole, as one looked down the wards, were more miserable-looking during the days of the epidemic than at any other time in my experience.

Of the more unusual features of the disease, it may be mentioned that anorexia, nausea and vomiting were much more common than usual. In 8 per cent. of the hospital cases, repeated emesis was noted. One patient came to the hospital for hiccups which had commenced on the second day of the disease, and had persisted continuously for forty hours before admission. Hemorrhage from the mucous membranes was a fairly prominent feature. Epistaxis occurred in 1 per cent. of the cases, and coughing up of blood from the lower respiratory passages in 1.5 per cent. Two patients vomited fresh blood in small amounts, and four passed noticeable amounts of fairly fresh blood by rectum. There were neither hemorrhoids nor symptoms of dysentery in the latter cases, and there was no evidence of tuberculosis in the cases in which the hemoptysis occurred.

The patients were all given a routine course of treatment, consisting of calomel and santonin followed by Epsom salt or castor oil, quinin, and occasionally acetylsalicylic acid for headache.

The death rate for the patients admitted to the hospital was very high for this disease, 2 per cent. instead of the usual 0.4 to 0.6 per cent. As one would expect, the mortality rate in the hospital was higher than in the city at large, although thirty-one deaths were reported to the bureau of health during the short period of the epidemic.

All of the patients dying in the hospital developed symptoms of pneumonia, and in one case in which a necropsy was performed, a large very foul-smelling abscess was found in the upper left lobe, while the lower left lobe was in the stage of red hepatization.

There is no question in the minds of the clinicians of Manila that this epidemic was influenza or the grip, but the following personal communication from Dr. J. W. Johnson, M. R. C., U. S. Army, shows that the causative agent was undoubtedly *Bacillus influenzae* of Pfeiffer:

> The organism found was small, about 0.5 micron in length by 0.3 micron in width, and had rounded ends. Staining with Loeffler's methylene blue gave best results, allowing the stain to act for not less than five minutes. The organism was gram-negative, and staining by this method had a tendency to be irregular. Blood agar (human blood) or agar streaked with fresh human blood gave best results as a culture medium. Small portions of sputum were picked up with sterile forceps, washed in sterile distilled water, and rubbed over blood agar plates or slants, and these were incubated at 37.5 C. Colonies appeared in about twenty-four hours as very minute transparent droplets, like dew drops, and gave the appearance of frosted glass. Cultures soon died out, and it was found that transplanting every two or three days was necessary. Even then, after three or four subcultures, growth ceased. The organism was recovered from the very first patients who clinically developed the disease. Cultures from the blood remained sterile.

CONCLUSION

An epidemic of the severe or epidemic type of influenza occurred in the Philippines in June, 1918, apparently spontaneous in origin. It was of more than usual severity, especially among the native peoples, and affected a larger proportion of the whole population than is the rule. Although at present we have no definite information that the epidemic has spread farther than to southern Japan, it is easy to imagine that this may be the beginning of another pandemic of the disease. It is highly desirable, therefore, that epidemics in other localities in the near future be promptly recognized and reported, so that the direction of travel and rapidity of dissemination of the disease may be learned. Should a pandemic be approaching the battle fronts, every effort will be necessary to prevent it from actually reaching and playing havoc in the Allied armies.

Complement Fixation Test for Syphilis.—In *Public Health Reports*, Aug. 23, 1918, M. H. Neill of the Public Health Service describes the method of performing the complement fixation test for syphilis as now used in the Hygienic Laboratory of the United States Public Health Service. It is a modification of the Wassermann test and the description is full and complete, with a list of the apparatus and reagents required.

THE MORPHOLOGY OF THE INFLUENZA BACILLUS *

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AND
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Pfeiffer[1] described a "true influenza" bacillus and a "pseudo-influenza bacillus." He was unable to distinguish these organisms in direct smears of exudates, where they both appeared as small bacilli with rounded ends. Culturally they were identical. He based his distinction on the fact that smears from cultures of the true influenza bacillus showed small bacilli with few longer forms, while smears made from cultures of the pseudo-influenza bacillus showed long, threadlike organisms. The pseudo-influenza bacillus was isolated by Pfeiffer from three cases of bronchopneumonia.

In bacteriologic examinations of the sputum, blood and lungs during the present epidemic of influenza, both forms of the influenza bacillus have been encountered. In some cases aerobic plates of the sputum have yielded practically pure cultures of the small gram-negative bacillus contaminated only by rare colonies of staphylococcus. Sputum from other cases has yielded equally pure cultures of the long, threadlike organism designated by Pfeiffer as pseudo-influenza bacillus.

This long, threadlike form appeared in the blood culture of a patient whose sputum contained the same type of organism. Aerobic plate cultures of the pneumonic area in a lung showed a pure culture of an organism which at the end of twenty-four hours' growth appeared in smears as a very small, gram-negative bacillus, and at the end of forty-eight hours, as long, wavy or curled, gram-negative threads which would ordinarily be classed as a leptothrix. In every case direct smears of the sputum showed only the small, bacillary form.

These findings suggested that however unlike the two forms appeared in smears made from cultures, there was a possibility that they were the same organism.

In order to determine if the reaction of the medium influenced the morphology of the organism, medium was prepared by adding human blood to a series of tubes containing agar which, after sterilization, titrated 1.5, 1.0, 0.4, 0.2 acid, neutral, 0.2, and 0.7 alkaline expressed in percentages of normal sodium hydroxid with phenolphthalein as an indicator. Seven sets of these tubes were inoculated with different strains of organisms. Four of the strains used were small bacilli, such as Pfeiffer termed true influenza. Three were the threadlike forms which he considered pseudo-influenza bacilli. Smears were made from the tubes at the end of twenty-four and forty-eight hours.

The three strains that resembled leptothrix in the original cultures still showed the long threads in the more acid medium, but on the 0.2 acid and neutral tubes they grew as small bacilli which could not be distinguished from true influenza bacilli. The four strains that grew in the original cultures as small bacilli showed transitions from the longer, sometimes threadlike forms on the more acid medium to the small bacillary forms on the slightly acid and neutral tubes.

Kato[2] reported a gram-negative leptothrix which he believed to be the cause of pleuropneumonia. In a bacteriologic study of the pneumonia occurring at Camp Pike last winter, Dick[3] found leptothrix organisms predominating on plates of the sputum in 6 per cent. of the cases. He described them as "very minute colonies, barely visible to the naked eye, but extremely numerous. There was no effect on blood. The organisms were gram-negative and varied in length from organisms resembling influenza bacilli, to long, slightly wavy organisms extending half way across the field. It was not possible to cultivate these organisms beyond one or two subcultures, and their importance is undetermined."

Where there is such variation in morphology in different cultures of the same strain, it does not seem justifiable to classify influenza bacilli as true and pseudo on the basis of morphology alone. In attempting to isolate influenza bacilli, it is important to recognize the leptothrix-like form as well as the small bacillary form.

* From the laboratory of St. Luke's Hospital.
1. Pfeiffer: Ztschr. f. Hyg., 1893, **13**, 356.

NOTES ON THE PRESENT EPIDEMIC OF RESPIRATORY DISEASE *

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From September 20 to October 31, we saw both in our services at the Michael Reese Hospital and in private practice approximately 500 cases of epidemic respiratory disease. The various forms of onset will easily fall into three groups: the first characterized by symptoms of a more or less severe coryza, the second by varying degrees of prostration, backache, headache, chilly sensations and elevated temperature, and the third by a feeling of indefinite discomfort, with no fever, but in a few hours a definite rise of temperature. Careful examination at the beginning of the disease, in all cases, usually revealed few signs, except for a slight reddening of the anterior pillars of the pharynx, and in many instances an intense congestion of the conjunctivae. Many patients who were coughing violently showed no signs of bronchial involvement, the cough probably being due to an intense congestion of the trachea. However, in a large percentage of our cases, careful examination at the onset showed a more or less circumscribed area, sometimes no larger than the bell of a stethoscope, which would manifest râles or dulness or changes in the breath sounds. It is our opinion that all these cases should be considered pneumonia, as a large percentage of this type does not show the drop to normal in three or four days.

DANGER OF PULMONARY SIGNS

One of the most important lessons learned from the epidemic is the potential danger residing in these small pulmonary signs, even when the temperature is normal. In several of our cases, a very slight pulmonary condition, after careless exposure to cold, developed into severe pneumonia. The development of pneumonic symptoms in these patients occurred either (1) after a complete defervescence, following on the footsteps

* From the Medical Service of the Michael Reese Hospital.
2. Kato: Mitt. a. d. Med. Fakt. d. k. Univ. zu Tokyo, 1915, **13**, 441.
3. Dick, G. F.: A Bacteriologic Study of the Pneumonia Occurring at Camp Pike, Ark., The Journal A. M. A., May 23, 1918, p. 1529.

of a more or less severe febrile period, lasting from one to two days; (2) after a drop in temperature, but not to normal, or (3) without a reduction, but instead with an elevation of the temperature on the third or fourth day. In any one of these three forms, the physical signs of bronchopneumonia would be present at the beginning of this phase of the disease, or would appear within a day or two. It is our opinion that the persistence or appearance of a rise in temperature on the third day indicates bronchopneumonia.

The appearance of the patient early in the disease does not betray his condition. Aside from the conjunctivitis and mild pharyngitis, already mentioned, the patient does not appear ill. Later, however, with the advance in the pneumonic process and an increase in the toxemia, cyanosis, sometimes with more or less edema of the face, becomes prominent. Stupor, restlessness and delirium may appear. At times, the uncanny combination of absence of the radial pulse, profuse perspiration and cyanosis, with the patient in full possession of his mental faculties, indicates only too clearly the fatal termination. The low pulse rate, which has been so characteristic of the disease, is a definite sign. Patients seen early with a pulse rate above 100 always evoke a suspicion of some other disease, although occasionally an increased pulse rate may have been caused by too large doses of acetylsalicylic acid. Late in the disease, with an increase in the severity of the condition, a rapid pulse rate is present. One rather striking feature was the inverted type of temperature. Many of our patients would be normal except at 4 or 8 a. m. The combination of the slow pulse, with this inverted type of temperature, sometimes made the diagnosis of influenza, when otherwise the diagnosis would have been difficult to establish.

Perhaps the most common site of the pneumonic disturbance was in the left lower lung, posteriorly, although no portion of the lung was particularly exempt, and no particular site had any special prognostic value. The type of pulmonary pathologic condition varied clinically from the small patch, which ordinarily would be considered merely a bronchitis, to a large massive pneumonia, with general edema of both lungs, and expectoration of bright red blood.

RESPIRATORY RATE

The respiratory rate early was as a rule slow, even though the temperature and pulse rate were increased. The appearance of an increased respiratory rate, from 40 to 50, indicated not only an increase in pulmonary involvement, but what seemed of more significance, an increase in toxemia. At times a definite air hunger, suggestive of a severe acidosis, made its appearance. From our experience, we have come to look on an increased respiratory rate, even though the temperature and pulse did not become elevated, as of more unfavorable significance than almost any other sign. On the contrary, when the temperature was high and the respiratory rate low, the condition was not considered unfavorable.

COUGH AND EXPECTORATION

Cough was a prominent and troublesome symptom in the majority of cases. Generally unproductive at the onset, later it became painful and accompanied by nummular expectoration and abdominal pain, probably muscular, from the strain of coughing. Where bloody expectoration occurred, the cough was not so frequently accompanied by pain.

PLEURITIC PAIN

Actual pleuritic pain, either thoracic or referred abdominal, occurred in a small percentage of cases. In these cases a pleuritic friction rub could be heard. Fluid in the chest, either serofibrinous, bloody or purulent, occurred, more frequently later in the epidemic than at the beginning. The removal of the fluid except in cases of empyema even in small amounts, by exploratory thoracentesis, seems to be followed by definitely favorable changes in the course. Involvement of the accessory sinuses of the nose is probably very common, and a routine examination ought to be established to rule this out. Ear infections, which were so common in the epidemic of 1891, were comparatively rare at the beginning of the epidemic, but apparently are becoming more prominent as late sequelae.

BLOOD PRESSURE

There was a normal or slightly diminished systolic blood pressure in those patients in whom the disease ran a moderate course. The diastolic pressure, however, was considerably lower than was to be expected. A systolic pressure of 100, with a diastolic pressure of 40, was a not uncommon occurrence. When the diastolic pressure was high or comparatively high, some cause was to be found, as a nephritis. One patient whose systolic pressure was 120, diastolic 85, with Cheyne-Stokes breathing during her pneumonic phase, had a systolic pressure of 180, and diastolic of 115 on recovery from the pneumonia. In no case, except when an organic heart lesion had previously existed, was there found a dilated right heart indicative of cardiac failure.

MENSTRUATION

In the women practically all menstruated between the first and third day of the disease, and many of these patients had considerable menstrual difficulty in the period following the disease. It is too early yet to speak definitely on this subject. Many women had considerable difficulty in urination at the beginning of the disease. Anuria of from twelve to twenty hours was not uncommon, so that catheterization had to be resorted to on account of a large urinary bladder tumor. Albumin and casts were found frequently in the later stages of the disease. Intense headache, rigidity of the neck and back, with spinal fluid under high pressure, suggested meningitis. However, cytologic and chemical study of the spinal fluid yielded negative results. The patient made an uneventful recovery.

Although one hears considerable of gastro-intestinal influenza, the large majority of the patients do not have gastro-intestinal symptoms, except when they are severely ill, when nausea, vomiting, and complete anorexia may set in. Many patients, however, complained of intense abdominal pain, which was apparently due to a muscular disturbance from the violent coughing. In the later stages of the epidemic, and likewise perhaps two or three weeks before the epidemic reached Chicago, we saw a number of cases of acute gastroenteritis which may or may not have been associated with the epidemic. In many instances, the clinical picture was similar except for the location of the disease.

BACTERIOLOGIC FINDINGS

The accompanying table (1) shows clearly the incidence of positive bacterial findings. Positive blood

cultures were without prognostic significance. A leukopenia was the rule, except when an empyema developed. In these cases, a leukocytosis from 10,000 to 18,000 obtained.

We had a number of cases complicating other diseases, and strangely enough these patients were apparently no worse off than others. We had three cases complicated by bronchial asthma, one with a massive pneumonia, and another in which the patient was not so severely ill; all made uneventful recoveries. At least one case, and perhaps more, occurred on top of an old pulmonary tuberculosis. Several patients had organic heart disease, and none of these died. Two cases complicated chronic nephritis; one patient made uneventful recovery and one died.

PERCENTAGE OF TIMES BACTERIA WERE PRESENT IN EXAMINATIONS *

	Number of Examinations	B. Influenzae	Streptococci			Pneumococcus	M. Catarrhalis	Friedlaender's Bacillus	Diphtheroids	Staphylococcus
			S. Viridans							
			Typical S. Viridans	Narrow Zone of Hemolysis after 24 Hrs.	Streptococcus Hemolyticus					
Sputum	13	8	46	80	8	23	0	8	0	100
Throat	125	12	20	70	10	64	17	13	12	80
Nose	22	0	10	5	0	18	0	0	0	91
Pleural exudate	8	0	12	38	0	25	0	0	0	0
Blood cultures	105	...	17	18						
Total	273	5.5	20	41	4.4	32	8	7	4	46

* This table was kindly prepared by Dr. Katherine Howell, who will later make a detailed report of her studies.

PREGNANCY AS A COMPLICATION

Perhaps the saddest feature of the whole epidemic was the effect on pregnant women or women with very young children. These cases were unquestionably the most severe in our experience, and many of these patients died. At present it is impossible to collect our statistics. These patients very early became markedly cyanotic, dyspneic, had rapid pulse, and massive (often hemorrhagic) pneumonia, and many of them from the first day of the illness gave an absolutely unfavorable prognosis. One patient in particular, a healthy young woman with two children, seen early in the epidemic, was moribund in twenty-four hours from the onset.

CLINICAL COURSE

The clinical course ranged from a few days to two weeks of acute symptoms. The distressing feature in many cases was that when the patient seemed to be progressing favorably toward an uneventful recovery, suddenly like lightning from a clear sky he would develop an increasing cyanosis, high temperature, high pulse and respiratory rate, a severe toxemia and pass away in from twelve to thirty-six hours. Relapses did not occur, although in two instances that came to our notice, patients died one week later from what appeared to be pulmonary embolism.

Convalescence was often very greatly prolonged, so that at times two or three weeks were required before the patient felt well enough to be up and about.

PROGNOSIS

No disease has ever been encountered in which it was more difficult to outline a prognosis. Patients, apparently mildly ill, suddenly on the third or fourth day would show a high temperature, cyanosis, rapid respiration and pneumonic consolidation, and would rapidly get worse. On the other hand, quite a number of our cases, especially those seen in the hospital, with cyanosis, lobar pneumonia and extremely toxic symptoms, pulled through to uneventful recoveries, without any special line of treatment. All the cases that were not complicated by pneumonia offer an absolutely good prognosis, but we had to be extremely cautious in all the pneumonic cases. Some factors which we considered of importance for prognosis are immediate taking to bed and keeping warm, with plenty of fresh air in the room and proper bedside care. By proper bedside care we mean absolute bed rest, the patient not being allowed to leave his bed for any purpose whatsoever. In several apparently mild cases pneumonia developed when the patient got up too soon, and it is our opinion that a certain percentage of the mortality from the epidemic might be prevented. Some patients die, no matter how excellent the care they obtain; but such a large proportion of the deaths occurred in patients apparently well who suddenly develop pneumonia, after exposure, that the impression of cause and effect is very definitely produced.

MORTALITY

The hospital statistics for the month of October show 269 admissions of all types, including moribund pneumonia patients. Of this number, forty-seven, or 17 per cent., died, but eleven of the forty-seven were in the hospital less than twenty-four hours, reducing the mortality to 13.4 per cent. From the hospital personnel of approximately 400 there were 107 admissions, of whom three, or 2.8 per cent., died.

TREATMENT

Prophylactic vaccination is as yet of unknown value. We know of at least three instances in which three doses of a vaccine had been given and influenza subsequently developed, and of over twenty instances in which one or two doses had been given, followed later by typical attacks of influenza and pneumonia.

We feel definitely that at present there is no special treatment. The two of us, working on independent services, gradually evolved an identical plan of practically leaving the patient alone and treating symptoms as they arose. We have used acetylsalicylic acid, 10 grains, or powder of ipecac and opium (Dover's powder) 10 grains, or both, with hot alkaline drinks and purgation for the first two days; then if there were any evidences of pneumonia, medication was removed and the patient treated purely for his symptoms. Heroin or morphin were found to be the best sedatives for the violent coughing and to keep the patient in comfort. We found that the administration of large quantities of fluids of all kinds by mouth, and when not retained, by rectum, either as plain tap water or with the addition of glucose, in 5 per cent. solution, and of urging the patient to take as much food as possible, with plenty of fresh air and warm coverings, were the most important factors in the treatment.

Early in the epidemic, we found that the administration of expectorants, salicylates, hexamethylenamin, quinin, etc., were of little value. Hexamethylenamin seems definitely contraindicated because of its tendency to produce hematuria. Cardiac stimulants, as digitalis, caffein and sodium benzoate, by mouth or hypodermi-

cally, were used, but with questionable value. Camphor in oil, pituitary solution in 7 minim doses, epinephrin in physiologic sodium chlorid solution by hypodermoclysis, and atropin in 1/60 to 1/100 grain doses, especially when an edema of the lungs was imminent, did not seem to alter the course of the disease. Whisky, brandy and aromatic spirit of ammonia were all used, but except for a temporary stimulation seemed useless. Champagne served in teaspoonful doses, with ice pellets, was sometimes the only thing the severely ill patients could tolerate without nausea. Oxygen by inhalation relieved the cyanosis, but had no effect on the course.

Convalescent serum (400 c.c.) was administered in one case, without preventing a fatal termination.

CONTAGIOUSNESS

A word as to the element of contagion. All of the interns who became ill had been in close contact with the patients, and many of the nurses who attended influenza patients subsequently became patients themselves, despite the fact that they took precautions to wear face masks while on duty taking care of patients, and to wash their hands in antiseptic solutions before leaving their patients. The air in one of the wards, on culture, yielded the hemolytic streptococcus.

CONCLUSIONS

1. The present epidemic of "influenza" or "influenzal bronchopneumonia" or "epidemic pneumonia" is as yet of unknown etiology.

2. The course of the disease, apparently mild at first, is treacherous, and not associated with any symptoms that might indicate the intensity or the severity.

3. In our hands no specific treatment seemed to have greater value than the induction of symptomatic relief, which we believe should be the hub of the treatment.

TWO CASES OF HUMAN ANTHRAX AT CAMP JACKSON *

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Anthrax, a disease of relatively rare occurrence in civil life in this country, has assumed a certain degree of importance because of scattered cases that have appeared in Army camps. A few cases have occurred in camps in this country, and in the British army the cases have been more numerous. Usually it is possible to trace the infection to contaminated shaving brushes. The occurrence of two cases in Camp Jackson within a very short period of each other, the first reported from this camp, appears worthy of record, especially in view of the fact that the first case was so atypical clinically that the nature of the condition could not be suspected without the laboratory findings.

REPORTS OF CASES

CASE 1.—*Clinical Course.*—A private of the One Hundred and Fifty-Sixth Depot Brigade, white, aged 23, was admitted to the base hospital, July 17, 1918. The family and previous history were negative. July 14, while shaving, he noticed a small pimple on the neck. He squeezed out a small amount of fluid; the lesion began to swell and grew worse from this time. By July 16 the swelling had extended well down on the chest. On admission both sides of the neck were swollen, the swelling extending downward on the chest to 1 inch below the nipple line. There was a small abrasion on the left side of the neck anteriorly. The pulse was weak, the skin was somewhat cyanosed, and respiration was sighing in character. The temperature on admission was 97.2, the pulse 124, respiration 26. The white blood cells numbered 16,500, of which 78 per cent. were neutrophils, 2 per cent. basophils, 13 per cent. small mononuclears, 5 per cent. large mononuclears, and 2 per cent. transitionals. The diagnosis made at this time was cellulitis of the neck. The patient's condition rapidly became worse. At 3 p. m. of the day of admission the swollen tissue was incised and drained, the incision consisting of a 4 inch median longitudinal incision, with a 4 inch subclavicular incision at each side. No pus was present. The incised tissue was edematous. Smears and cultures were made from the fluid that exuded from the incision. A blood culture was taken on the evening of the day of admission; the blood at this time was very thick and dark and coagulated quickly. When the dressing was changed at 3:30 a. m. of the next day a large amount of serum was present, and the swelling of the chest had decreased slightly. The patient appeared very ill. Examination of the cultures made from the incision and of the blood culture showed the presence of *B. anthracis*. At 9 a. m., July 18, the dressing was changed again, a large amount of serum being present. The patient failed rapidly and died at noon, July 18.

Necropsy.—This was done four hours after death. In the region of the upper chest was an open crucial incision that extended through the skin and soft parts to the underlying bone. The longitudinal limb of the incision extended from the sternal notch to the middle region of the sternum. The horizontal limb extended from the middle of the left clavicle to the middle of the right clavicle. The margins of the incision were retracted, and the exposed tissue was found to be covered by a thin layer of grayish white material. Slightly to the left of the midline of the neck and 5 cm. above the clavicular line was an oval superficial skin lesion, 0.5 by 1 cm., covered with a dark crust. The neck was swollen, the swelling extending laterally on each side to the line of the mastoid region. The skin of the swollen region was slightly reddened and felt boggy. The cervical glands were not palpable. In the inferior chest region, below the lower end of the longitudinal incision, the subcutaneous tissue was edematous and gelatinous. The loose tissue of the upper anterior mediastinum was edematous. The spleen was increased in size to about four times the normal. The capsule was tense, free of adhesions, and bluish. The tissue on section was dark red and moderately firm. The malpighian bodies stood out as grayish translucent points up to 1 mm. in diameter.

Microscopic Examination.—In sections from the edematous subcutaneous tissue of the chest, the collagen fibers were swollen, fibrillated and granular, and the tissue spaces were filled with granular, eosin stained, structureless material in which a fibrin meshwork was present. The tissue was richly infiltrated with polymorphonuclear leukocytes, and contained many large gram-positive bacilli, which often formed long threads. In the underlying muscle, some fibers were swollen and faintly stained, and others were compressed and hyaline; most of the fibers had lost their cross striations. Sections of organs and tissues other than the subcutaneous tissue contained a few scattered, large, gram-positive bacilli in the capillaries. In the subcutaneous tissue the bacilli were numerous.

Bacteriologic Examinations.—Cultures from the small local lesion of the neck and from the fluid of the incision, made at the time of operation, gave a pure culture of a gram-positive, nonmotile bacillus, morphologically *B. anthracis*. A blood culture made on the evening of the day before death gave a pure culture of the same organism; 0.1 c.c. of this culture inoculated subcutaneously into a white mouse caused the death of the latter in twelve hours, and from the heart's blood of the mouse *B. anthracis* was again isolated. Smears from the spleen and liver at necropsy showed the same organism

* From the laboratory of the Base Hospital, Camp Jackson, Marshall A. Barber, Captain, S. C., U. S. Army, Chief of Laboratory.

obtained in culture. Cultures from the spleen gave a heavy growth of *B. anthracis*.

Diagnosis.—The findings in the case may be thus summarized: anthrax of the skin; generalized anthrax bacteremia; gelatinous subcutaneous edema of neck and chest; surgical incision of upper thorax; acute splenic tumor; passive congestion of the liver; cloudy swelling of the liver and kidneys.

Cultures were made of the shaving brush, shaving soap and razor strop used by the soldier, but *B. anthracis* was not isolated.

Case 2.—*Clinical Course.*—A private of the One Hundred and Fifty-Sixth Depot Brigade, aged 26, white, was admitted to the base hospital, July 27, 1918, with swelling and edema of the right side of the face and neck. He arrived at camp with a group of drafted men, July 27, at 1:30 a. m., having come from Dayton, Ohio. He gave a history of having shaved at Dayton with a new shaving brush, July 24. He noticed a small, pimple-like lesion of the center of the right cheek a day or so later. When admitted there was a black necrotic area one-eighth inch in diameter at the center of the right cheek, surrounded by a red ring with a few broken vesicles. The whole cheek from the eye to the side of the neck was edematous. The supraclavicular glands were enlarged and tender. The temperature on admission was 101, going to 103 at 6 p. m. of the same day. The patient appeared only moderately ill. A diagnosis of probable anthrax was made by Major James S. Stone, chief of the surgical service.

Smears and cultures from the lesion and a blood culture were made immediately after admission. Clear serum in large amounts exuded from the inflamed tissue about the escharotic center. The smears showed the presence of a large, gram-positive, encapsulated bacillus, morphologically *B. anthracis*. From the cultures of the local lesion, *B. anthracis* was obtained. The blood culture showed no growth during the first twenty-four hours, but at the end of a second twenty-four hour period of incubation *B. anthracis* had developed. This material inoculated into a white mouse killed the animal within twenty-four hours, and from the heart's blood of the mouse, *B. anthracis* was again isolated.

Treatment and Result.—At 4 p. m. of the day of admission, 50 c.c. of antistreptococcic serum were given intravenously. The entire treatment was conservative. The lesion was not excised or incised, but was kept covered with a moist Epsom salt dressing. On the day after admission the evening temperature rose to 103.1. The swelling of the face had increased, the right eye was closed, but the general condition was good. On the second day after admission (July 29) the edema of the face had begun to decrease and the patient felt well; the maximum temperature (evening) was 101.2. By July 31 the swelling had decreased to such a degree that the right eye was open, and the temperature and pulse had returned to normal, remaining normal throughout the rest of the course of the disease. Later notes found in the clinical record are: August 4, "Condition good. Pustule cleaning." August 11, "Depression in right cheek, about size of a quarter, looks fine; granulations forming. Swelling subsiding." The further course was uneventful. The blood examination at different times gave:

	Red Blood Cells	White Blood Cells	Hemoglobin	Polymorphonuclears	Small Mononuclears	Large Mononuclears
Aug. 1.	4,060,000	10,000	90%	76%	22%	2%
Aug. 2.	4,060,000	10,200	....	78%	19%	3%
Aug. 16.	5,300,000	4,000	95%	72%	25%	3%

Cultures were made of the shaving brush, a new one used for the first time, July 24, and not used again thereafter, but *B. anthracis* was not isolated.

Two other cases, proved by laboratory examination to be not anthrax, are of interest because they were clinically so much like anthrax that this was the probable clinical diagnosis on admission. In each case the local lesion was noticed while the patient was shaving or a day thereafter.

In the first of these two cases, in which the patient was admitted a few days after the first patient with anthrax, there was a reddened area on the anterior portion of the left cheek, and the entire cheek was markedly swollen. Smears and cultures showed the presence of streptococcus. Surgical incision opened a small collection of pus deep in the cheek. Recovery was rapid and uneventful.

The second patient was admitted two weeks after the second patient with anthrax. On the right side of the chin there was a dark, dry, escharotic lesion 0.5 cm. in diameter, surrounded by a red ring, on which were a number of small, superficial vesicles from which much clear serum exuded. The surrounding skin was swollen and hard. The lesion had the appearance of a typical malignant pustule. There were no constitutional symptoms. Smears and cultures made at repeated intervals on the day of admission and on the succeeding day revealed only *Staphylococcus albus*. By the second day the lesion had lost its anthrax-like character and had taken on that of a simple abscess. The further course was that of a staphylococcus abscess, and the lesion healed rapidly without incision.

COMMENT

The cases here reported add two more to the number of cases of anthrax that have occurred in Army camps in this country. In each case the development of the initial lesion bore a relationship to the use of a new shaving brush. Although *B. anthracis* was not isolated from either brush, perhaps because the brushes had been well washed after use, it is probable that the infection in each case was derived from a contaminated brush. Because of the danger of infection by brushes made from the hairs of animals dead of anthrax, the sale of such brushes should be prohibited. Attempts have been made in this laboratory to sterilize shaving brushes on sale at the exchanges in this camp, but the various methods tried result in the destruction of a large part of the brushes, especially the cheaper kind, which are most to blame.

SUMMARY

Two cases of anthrax have recently occurred at Camp Jackson. In each case the infection was probably due to the use of a contaminated shaving brush.

One case was atypical clinically and ended fatally. In the other, which was clinically a typical case of malignant pustule, the patient recovered. In each case *B. anthracis* was obtained in blood culture.

Two other cases simulated very closely the malignant pustule form of anthrax, but were proved by bacteriologic examination to be due to pyogenic cocci.

Every suspicious lesion of the face should be examined early for *B. anthracis*, and the examination should be repeated if negative.

The sale of all shaving brushes in which there is a possibility that the hairs of animals dead of anthrax have been used should be prohibited.

Exclusion of Pylorus by Rubber Band.—A. L. Soresi passes an ordinary rubber band around the pylorus by a thread attached to one end of the cut band. The band is drawn up tight to ligate the pylorus, and the ends are tied with silk or linen thread and are then cut off close. The rubber band is the ordinary office kind, about 3 cm. in diameter and 0.5 cm. wide. The gentle persistent pressure from the band prevents the plyorus from getting a chance to open, and its power of contraction is thus gradually completely lost. The compressed portion becomes anemic, and the tissue on each side of the anemic strip hypertrophies. With any other method of occlusion, as the compressed strip atrophies, the compression grows less, and the pylorus gets a chance to contract. This cannot occur under the continuous elastic pressure which keeps up the same no matter how much the tissues beneath atrophy. His method was illustrated in the *Clinica Chirurgica*, 1917, **25**, 386.

INFLUENZA

ABSTRACTS OF FOREIGN LITERATURE COMPILED BY BRITISH MEDICAL RESEARCH COMMITTEE

[NOTE.—The following abstract on influenza is taken from the Medical Supplement compiled by the Medical Research Committee of Great Britain and issued by the General Staff under date of October 1. It apparently covers all the important recent literature on this subject, and especially German literature, which is not now available in this country.—ED.]

In spite of the fact that influenza recurs in modern times every twenty to thirty years in explosive waves spreading through whole continents, and that twenty-seven years have elapsed since the last pandemic, there has been neither an intelligent anticipation of the event nor certainty as to the true nature of the gigantic outbreak when it appeared a few months ago.

Responsible authors lamented the coming of a new "Spanish" disease, oblivious of history, which records epidemics of "Spanish catarrhs" as far back as the sixteenth century. Incredible as it may seem, the convenient hypothesis of "collective food poisoning" was not lost sight of. In fact, one cannot but agree with Bergmann of Marburg, who remarks that the present epidemic would not be typical if typical mistakes were not committed again this year. "The meteorologists try again to ascertain the course of the epidemic, the English again recommend quinin as a panacea, and a new erroneous teaching seeks to explain the progress and intensity of the disease (in Germany) by malnourishment, although it does not spare better stocked countries. The epidemic has always adapted itself to the rapidity of the human means of communication. In Turkestan it spreads with the rapidity of a caravan, in Europe with that of an express train, in the wide world with that of an ocean liner, and today perhaps with the speed of a Rumpel-Taube or a Fokker."

The symptomatology is held by certain authors to differ from the pandemic of 1890-1892 in certain respects, as, for example, in that acute nasal catarrh was conspicuous by its absence this year. This raises the fundamental question as to the concept of influenza. Is it the clinical picture down to the least significant symptom or the epidemiologic characters of outbreak and course of spread which make of "influenza" an entity?

EPIDEMIOLOGY

Epidemiologically the extreme contagiousness of the disease was proved to be due to its aerial convection, namely, by means of the "drop infection" from person to person, and not by transportation of the virus through the air at large, through winds, etc.

Thus in July this year in a German field regiment the first battalion to be attacked was that which fought at close quarters with a—presumably infected—American detachment. During a temporary lull companies of the other battalions fell victim to the infection in order as they were sent to relieve one another in a tunnel which was the scene of the fighting. The infection is always bound up with the diseased individual.

HISTORICAL

This infection one was taught since 1892 to regard as being identical with the hemophilic *B. influenzae* discovered by R. Pfeiffer during a secondary recrudescent wave of the last pandemic. It has often been isolated in the interval from sporadic cases or limited outbreaks of nasobronchial affections giving a picture of "grip." It was found, as a rule, in the sputum or the nasal discharge, though records of recoveries from various serous cavities, etc., are also scattered through the bacteriologic literature of all countries. Although Pfeiffer's bacillus was found to be practically nonpathogenic to animals and proved to be a very unreliable antigen, yet its regular plentiful presence in the lungs in fatal cases of bronchopneumonia during the secondary epidemics of 1892-1893, and its obvious intimate connection with characteristic pathologic processes earned for it an unassailable position as a classical specific virus. Modern bacteriology identified the bacillus with influenza, and thus the orthodox concept of this disease resolved itself into the belief that there was no influenza in the absence of Pfeiffer's bacillus. With the final disappearance of all the after-epidemics of the 1890 decade, the findings of the Pfeiffer bacillus became less frequent, yet Europe was not free from widespread localized outbreaks of influenza-like diseases. Wassermann sought to explain this phenomenon by the assumption that the population of Europe had become immunized after the prolonged prevalence of influenza, and that consequently the bacilli tended quickly to disappear from the sputum and to elude cultural recovery. However, as time went on and the bacteriologic technic increased in perfection, various organisms other than *B. influenzae* were being discovered as their several etiologic agents with as much evidence as there was for the acceptance of the Pfeiffer bacillus. In fact, if an organism was recovered from the majority of cases, if it was present in tissues in undoubted connection with the lesions, if the character of growth made of it an "unusual" host, if it was cultivated from the blood of the patients, and if it induced a serologic response on the part of patients and convalescents, there were no grounds—in modern bacteriologic reasoning—to doubt its association with the epidemic. The Pfeiffer school stuck, however, to its guns, and maintained that the various non-Pfeiffer epidemics were not a true influenza. These, in their reasoning, were all members of a large group of "endemic grip" characterized by coryza, and were similar to ancient affections well described by the authors of the seventies and eighties prior to the last pandemic. Yet, the argument continued, when the pandemic broke out, the same authors acknowledged its essential difference from the previously prevalent "contagious catarrhs," and recognized it as a disease completely new in their experience. One need not quote extracts, for, indeed, the European medical literature of the last two months abounds in statements of an identical nature! The Pfeiffer school further insisted on epidemiologic dissimilarities, and argued that Pfeiffer's bacillus was the cause of the real pandemic disease, while the multiform catarrhal outbreaks, the "endemic grip," were indeed caused by a whole museum of bacteria mainly belonging to the coccal group. This was the argument developed by Scheller, a prominent pupil of Pfeiffer, in August, 1917, when Stephan described *Diplococcus mucosus* as the agent of a clinically typical "endemic" of influenza which broke out in December, 1916, in Strümpell's clinic at Leipzig. The diplococcus was isolated from the sputum and the blood of the patients, it was specifically agglutinated by an immune serum as well as by patients' and convalescents' serum. Not unlike the meningococcus, it differed from it in that it produced a capsule in the body and mucus on some mediums that it grew on ordinary agar and at 20 C., as well as by its variable retention of Gram's staining. Nonpathogenic to animals, it could not be identified with *Streptococcus mucosus* of Schottmüller; insoluble in bile, it was not identical with the group of pneumococci, particularly the *Pneumococcus mucosus* of the American authors. Fermenting maltose, glucose, levulose and galactose, it differed from the *Micrococcus catarrhalis* group. Its immune rabbit serum differentiated it easily from both the *Diplococcus crassus* and *flavus*.

Lingelsheim promptly acknowledged the organism as one described by him some years previously during his studies on the meningococci, but Scheller, who examined Stephan's cultures, could not confirm its variable behavior to Gram, and pronounced it frankly gram-positive. It is worth mentioning that in Strümpell's clinic the influenzal infection produced by the *Diplococcus mucosus-Leipzig*, as it was designated by Stephan, was held to have been a true septicemia, and that hemorrhagic nephritis was a frequent complication, while in some cases there was distinct meningism. This last finding is of some interest, for Stephan recovered a somewhat similar organism from the cerebrospinal fluid in an epidemic investigated by him in 1916 in a fever hospital in

northern France. It was found, on the whole, not to possess a marked virulence.

BRITISH EPIDEMIC OF 1915

The Leipzig epidemic was not an isolated instance of a European influenzal disturbance. Shera early in 1917 gave an account of an influenzal epidemic of the spring of 1915 in London and the southern counties, in which he claimed to have occasionally isolated a bacillus similar to *B. influenzae*, but it is somewhat difficult to identify it from the scanty details given. Lenz drew attention to very frequent occurrence of pneumonias in 1915 in German prisoners' camps. Coincidently with both the epidemics observed by Stephan, catarrhs and bronchitic infections localized in the bronchioles appear to have been very prevalent in December, 1916, and January, 1917, in military hospitals in France and also at home. The *British Medical Journal* drew attention to their extent in a special article, stating generally that their bacteriologic character was rather undecided, though a coccal (mainly pneumococcal) nature was assumed. The infections were stated to have run an acute course. At about the same period, in the late winter of 1917, a "grippal" outbreak visited Vienna and lower Austria, but *B. influenzae* was not found, because Economo (*Medical Supplement*, 1918, **1**, 220), in his account of encephalitis lethargica, insists in his differential diagnosis on this fact. Von Wiesner (*Medical Supplement*, ibid.), describing the diplococcus which, he claimed, had caused the epidemic of encephalitis, emphasized the frequent findings on postmortem examinations of that period of lesions indicative of hemorrhagic diathesis, produced, in his opinion, by the "diplococcus of encephalitis." It may be noted that this organism was held to behave variably toward gram-staining, to have been pleomorphic, and insoluble in bile. The pleomorphic diplococcus discovered and described by Rosenow and his collaborators in America at the time of the 1916 and 1917 epidemics of poliomyelitis falls undoubtedly into the same group of organisms. Incidentally it may be added that bronchopneumonias were often found to have been the determining cause of death in both the Viennese and the American outbreaks of poliencephalomyelitis.

EPIDEMICS IN 1917

The winter of 1917 was indeed pregnant with unusual diseases, for very fatal infections of purulent bronchitis were recorded at the base hospitals in France. Hammond, Rolland and Shore gave an exquisite account of their bacteriologic and pathologic characters. Gram-negative coccobacilli identified as Pfeiffer's bacillus, nonvirulent to animals, assuming coccoid forms when degenerating, were obtained from the sputums in a proportion of eighteen out of thirty; they were grown on trypsin-broth-legume-agar, and the authors, one may assume, were satisfied as to their true hemophilic nature. Pathologically, there was marked purulent bronchitis, the smallest bronchi being filled up with pus, and in some cases secondary bronchopneumonias developed. Pleurisies and empyemas were a feature, while there was also general evidence of a toxemia in the organs and the heart muscle. Signs of a right-side heart failure were frequent.

Having subsided during the summer, the epidemic seems to have broken loose again last autumn, and Hallows, Eyre and French reported very fully on an epidemic of pneumonia at the Aldershot command in September, 1917. Purulent bronchiolitis, identical with that of Hammond, Rolland and Shore, was found, and both typical *B. influenzae* (Pfeiffer) and the pneumococcus were recovered from the sputums of the organs, though *B. influenzae* was not obtained in any large proportion of cases.

INFECTIVE ENCEPHALITIS

The late winter and spring of this year witnessed the epidemic of infective encephalitis in this country, while isolated outbreaks of virulent pneumonias seem also to have been observed. At one of the London hospitals (unpublished observation) a diplococcus identical with that of Rosenow was obtained in several cases of encephalitis and frequently found in the routine examination of throat swabs. "During the first week of May of this year an acute febrile disease with symptoms resembling those of influenza invaded three factories and one industrial home for boys in Glasgow," to quote MacLean. "The bacillus of influenza was invariably absent. . . . A gram-negative diplococcus resembling the pneumococcus has frequently been obtained from the nose, throat, lungs and membranes of the brain." A few months ago Rosenow found streptococci in an outbreak of "grip" in Chicago.

Thus it is clear that in the three years 1915 to 1917 diplococci were the predominating organisms associated with influenza-like infections, although it is difficult to pronounce as to the identity of the several strains described. Hemorrhagic lesions seem to have been induced by two types. The bacillus of Pfeiffer had been found but occasionally. This was in keeping with the orthodox teaching which claimed that only a new pandemic of true influenza could finally decide, and would convince the disbelievers, as to the real specific nature of the organism. The results of the work of the last three months, however, have belied these expectations.

The two leading London medical weeklies contain to date seven original contributions to the elucidation of this crucial problem.

BRITISH LITERATURE

Little, Garofalo and Williams flatly deny that the pandemic is a true influenza. For, first, no relapses or complications were observed by them in France; secondly, in the twenty cases examined by them, there was very slight leukocytosis with a proportional lymphocytosis of a small mononuclear variety, and lastly, as in all the twenty cases, a very small gram-positive diplococcus was of "universal predominance." It was absent from the two blood cultures that were undertaken. It was recovered from nasopharyngeal and throat swabs and from the sputum. Morphologically it was flattened out on apposing sides. It appeared sometimes in pure culture. Grown on legumin-serum agar, it developed in small transparent granular streptococcal-like colonies. It showed a slight tendency to anaerobic growth, fermented no sugars and was nonpathogenic to animals.

The reported absence of *B. influenzae* would sound more convincing if the elementary precaution of planting out sputums on blood agar had been adhered to.

Burnford characterized the outbreak as an acute fever accompanied by a general polyadenitis with no specific "germs" discoverable to account for the condition.

Gotch and Whittingham examined carefully fifty cases. Leukopenia with a neutrophilia at the height of fever, accompanied by a slow pulse, were pathologic features observed. In 8 per cent. of the throat swabs and sputums, *B. influenzae* was found. In the remaining cases there was constantly present a gram-negative diplococcus not unlike *M. catarrhalis*, while in 10 per cent. of cases there was also a coccus similar to the meningococcus. The fairly large predominant diplococcus was also recovered from the blood, and its cultures proved pathogenic to man in the two instances in which the disease was experimentally transmitted by means of its cultures. The organism, if properly investigated, might be found related to the larger group of cocci previously dealt with.

On the same date Krumbhaar related in a letter the results of his study in a "small group of cases," from three quarters of the number of which a short, moderately slender, gram-negative bacillus tending to form groups and growing in typical, small watery colonies on blood agar was recovered and identified as *B. influenzae* on the ground of the foregoing characteristics. It was added that according to verbal communications from France, Pfeiffer's bacillus was being isolated from sputums.

Matthews, who examined in London "about a dozen typical cases," ascertained in every one of them by means of the West postnasal swab planted on the author's trypsinized broth-blood agar the presence of *B. influenzae* "as a rule typical, but not infrequently in enormously long filaments." On ordinary blood agar the strains recovered their typical appearance, while on the author's medium they grew in large-sized colonies, 3 mm. broad, translucent, of hemispherical

shape, brownish tinged with a regularly circular outline. No more precise details are given.

Averill, Young and Griffiths had under their care 1,439 patients, of whom sixteen developed lobar pneumonias with seven fatal issues. No account is given of postmortem examinations. Forty-three cases were examined bacteriologically. *B. influenzae* was not detected in the nasopharynx, a gram-positive diplococcus being predominant. The sputum of forty-one patients showed in thirty-two cases the presence of the same diplococcus associated with a gram-negative bacillus often in clumps. In nine other instances the diplococcus retained the field to itself. Grown on ordinary agar the sputums yielded colonies of the diplococcus only, while on blood agar discrete, transparent, smooth, rounded-edged colonies developed in addition. On prolonged counterstaining of the culture smears with 5 per cent. carbolfuchsin (ten minutes), small gram-negative coccobacilli with rounded ends, slightly bipolar and slightly larger than in the direct films were detected. They refused to grow on ordinary agar, fermented no sugars, and were, therefore, identified as Pfeiffer's bacillus, while the coccus was diagnosed as a pneumococcus.

Both these conclusions require further evidence, as the description of the coccobacilli fits in rather with the characters of Bordet's *B. pertussis* than of the classical bacillus of Pfeiffer, while no reasons are given for the assumption of a pneumococcal nature of the diplococcus.

Finally, Maude, who observed 2,067 cases, of which 248 were hospital admissions with three deaths, insists on the high percentage of patients who developed the complex lung conditions previously described by Hallows, Eyre and French. No systematic bacteriologic examinations were made by the author, who relies on the definition given in September, 1917, by Eyre of a double successive infection by *B. influenzae* and the pneumococcus.

Thus—on a summary—*B. influenzae* was doubtfully reported in some, undoubtedly present in other groups of cases, while two types of cocci were predominant in the hands of the remaining authors. Unfortunately the material actually dealt with so far was not sufficient in quantity to warrant the responsibility of drawing therefrom any general conclusions.

GERMAN LITERATURE

In Germany the widespread outbreak of influenza aroused a considerable and immediate scientific interest; the medical societies of Berlin and Munich held special meetings early in July, at which the identity of the prevalent disease with the last pandemic was recognized by a majority of the authorities after detailed discussions. This recognition was made all the easier as organs preserved since 1890-1892 were found on comparison with those obtained from fresh fatal cases to exhibit corresponding lesions, Lubarsch and Hansemann particularly insisting on the essential similarity.

The morbid anatomy of the present pandemic was studied in detail by a number of authors. Thus:

Oberndorfer investigated a large series of postmortem examinations in Munich (number not stated: apparently thirty-one).

Lubarsch reports on fourteen postmortem examinations from Berlin.

Schmorl reports on fifty postmortem examinations from Dresden.

Bernhardt and Meyer report on twenty-eight postmortem examinations from Stettin.

Simmonds reports on twenty-eight postmortem examinations from Hamburg.

Hirschbruch reports on sixteen postmortem examinations from Metz.

Dietrich reports on seven postmortem examinations from a field laboratory.

Bergmann (Marburg), Selter (Königsberg) and Gruber and Schädel (Mainz), a few each.

Oberndorfer's, Schmorl's and Lubarsch's descriptions may be taken as a standard, the other authors generally finding themselves in agreement with them.

Oberndorfer examined only very acute cases of the first fortnight of the epidemic. These were all men, mainly between the ages of 17 and 25. The lesions of the respiratory organs were so typical that the author could almost dictate seriatim identical protocols.

SYMPTOMS AND PATHOLOGY

In the initial stage of the affection of the lungs, namely, when only small foci without any great reaction in the immediate neighborhood are observed, the most striking findings were small, bean-sized hemorrhages projecting into the lung tissue. As a next step there followed a firmer infiltration of the parenchyma, the nodules sitting subpleurally and raising the pleura in consequence. A whole scale of intermediate formations lay between these small nodules and large hemorrhagic tuberous infiltrations; all possible gradations were observed from simple blood extravasations into the lung tissue, still containing air, to firm, almost dry, infarct-like hemorrhages of a bluish-black tinge. These extensive infiltrations were of the same shape as the usual pulmonary hemorrhagic infarcts, namely, they had the form of a wedge with its base resting on the pleura, thus clearly indicating an intimate relationship with the vascular system of the lungs. In this purely hemorrhagic initial stage no thrombi were ever found in these arteries, the extravasation of red cells being obviously due to an abnormal permeability of certain portions of the arterial system.

The second stage was characterized by exudative pneumonic processes combined with hemorrhages. The picture varied considerably at times. There may be a true croupous hepatization of lobular, or even lobar, extent, both red and gray, though the tinge was usually brownish and not as a rule very distinct. These pneumonic infiltrations usually embraced in their center circumscribed hemorrhages. The surface on section was not dry, being covered by a slimy, dirty coating, thus resembling a picture of Friedlaender's pneumonia. The pneumonic foci were sometimes flattened out at the ends into yellowish white wedge-shaped strictures corresponding to anemic infarcts both in form and color. These often became the seat of gangrene or suppuration, the pleura also being obviously involved in the process. In the majority of cases it was a catarrhal and desquamative succulent infiltration rather than a fibrinous exudation, but almost always severely complicated by suppuration.

The bronchi were filled with pus already in the first stage, the smaller branches containing thin fluid, though at times dried-up exudates formed firm plugs occluding the lumen of the bronchioli. This purulent bronchitis had as its consequence an extensive bronchiectasis with the bronchi distended cylindrically. The bronchi and their blood vessels were often surrounded by purulent infiltrations originating from the lymphatic system. In other cases, again, there were seen on section enormous numbers of minute abscesses surrounded by hemorrhages, the suppuration being obviously hematogenic in origin. These minute abscesses often became confluent, thus ending up by the formation of large caverns of pus.

The pleura participated in the process. The first signs consisted in punctiform hemorrhages, or ecchymoses; serous exudations followed next, and, as often as not, empyemas completed the picture. As a rule, one side only was affected. Pericarditis was a natural consequence of pleuritis. There were no gross changes in the heart save for some thickening of the arteries of the lung hilum. Occasionally incipient endocarditis was encountered.

The larynx and the upper third of the trachea showed no involvement in the process. The lower portion, however, was the seat of an intense mucopurulent exudation, which in many cases assumed a fibrinous character, with the consequent formation of extensive pseudomembranes in the lower trachea and down into the bronchi. Sometimes edema of the epiglottis was observed.

A striking feature was presented by the hyperplastic condition of the lymphatic apparatus of the tongue and the tracheal ring. The thymus was well preserved, the cervical and axillary, but not the inguinal, glands were enlarged. On the whole, an impression of the existence of a status thymolymphaticus was conveyed. As young individuals were

mainly affected, these two facts may stand in a relation of cause and effect.

The spleen was enlarged, sometimes a septic spleen tumor being found.

The liver was but seldom involved; the kidneys showed a general hyperemic condition. In the brain and the meninges there was a marked vasodilatation, but no meningitis was noted. Punctiform hemorrhages, in the form of a purpura hemorrhagica, were met with in the corpus ammonis and the cerebellum.

The histologic examination revealed the following unusual findings: in the trachea, an intense exudation of fibrin in the deep layers of the mucosa, and a progressive inflammation of the deeper portions of the tracheal walls; in the lymphatic glands, an enormous vasodilatation, hemorrhages, as well as proliferation of the endothelium, particularly in the axillary glands.

The foci of inflammation in the lungs showed a leukocytic infiltration around the alveoli, bronchi, and the walls of small arteries. It did not involve the whole vessels, which were dotted with isolated spots of infiltration. There were also hemorrhages into the heart valves, with a consequent displacement of the fibers and damage to the endothelium; thus no definite endocarditis, but lesions, which facilitated the development of a secondary mycotic endocarditis. There were, therefore, signs of a lesion of the walls of the vessels, which were particularly marked in two cases in the arteria pulmonalis. A very advanced mycotic arteritis was detected here, exhibiting a leukocytic infiltration of the whole wall, particularly of the innermost layers, with displacement of elastic fibers and a necrotic fibrinous coating on the partly necrosed intima. The gram-staining revealed the presence of masses of streptococci, though there was no indication in these cases of a lymphangitis. Thus the whole character of the lesion, and particularly the localization of the most intense process on the internal wall, points to a primary affection of the intima.

PATHOLOGIC PICTURE

The essence of the whole pathologic picture consists, therefore, in the abundance of hemorrhages seen in the mucous and serous membranes, in the respiratory tract, and in the lungs, which indicated a damaged condition of the capillary vascular system. The abscesses, save for those originating in the bronchi, were also of a hematogenic nature. The whole process seems to be primarily a bacteremia localized in particular in the pulmonary blood vessels. Hemorrhages in the lungs pave the way for a secondary infection, the results of which dominate the whole field in the later stages. In any case the wedgelike shape of the pulmonary foci indicated a vascular origin of the lesions. From a purely anatomic point of view the condition bears many points of resemblance with pneumonic plague, though there is no indication as to an entry of the virus through definite lymphatic channels. The primary bacteremic condition was not found to be due to *B. influenzae* (Pfeiffer), and thus the invading virus remained undiscovered.

Lubarsch found essentially similar lesions in his fourteen cases. The age and sex incidence was the same, all being men, six of them under 20, five between 27 and 29, and only three over 30 (30, 33, 42). They were particularly well-built and well-nourished individuals. The author lays more stress than Oberndorfer on the pseudomembranous condition of the lower trachea and the bronchi, which sometimes attained the intensity of a true diphtheritic inflammation in the sense of Virchow, one could almost say of a necrosing inflammation. The changes in the lungs are particularly characterized by the tendency to spread over the pleura in an extraordinarily quick time, so much so that a genuine necrosis of the pleura is sometimes seen. In some cases the pleuritic lesions constitute the main damage, and death is caused by the consequent compression of the lungs. The essentially hemorrhagic character of the pulmonary processes is shown by the fact that in the rare cases in which the naked eye appearance gives no ground to suspect hemorrhages these are revealed by microscopic examination. Blood extravasations were also found in the mucous membranes of the stomach, the intestines and in the pelvis of the kidneys.

B. influenzae was found only once, namely, by microscopic examination of a section of the lungs. Streptococci were usually recovered from the blood, the lungs or the spleen. It is these organisms which caused death, not through generalized infection, but by producing fatal local lesions. Pfeiffer's bacillus, should it ultimately be found to be the primary cause of the pandemic, is not in any case a virulent agent, its exclusive multiplication in the body leading only very occasionally to a fatal issue.

Schmorl's fifty patients again corresponded in age incidence with the previous series. The ages of forty-seven ranged between 11 and 27, the remaining five consisting of two aged 48, two 36, and one 70. They were all persons in vigorous health. While in general agreement with the previous authors, he was particularly impressed by the diphtheritic inflammation of the trachea and bronchi, which he examined very carefully in sections, and found streptococci and pneumococci, occasionally staphylococci, associated with it, but neither *B. influenzae* nor *B. diphtheriae*. This condition is, in his opinion, very rare in influenza, but forms a strikingly common feature of the present epidemic; if diligently looked for, it will not be missed in many cases. A waxy degeneration of muscles, particularly the rectus abdominis, was encountered, as an indication of a central toxic influence.

But the most interesting finding of Schmorl is the frequent occurrence of hemorrhagic encephalitis. During the 1890 pandemic Schmorl made 120 postmortem examinations at Leipzig without recording this condition once. This year out of forty-four cases in which the central nervous system was examined, it was present in fifteen. The white substance of the cortex and both the gray and white of the central ganglions abounded in punctiform hemorrhages, the posterior part of the corpus callosum being most affected. The cerebellum, pons and medulla oblongata, as well as the parenchyma, are only occasionally involved. In some cases the thalamus opticus alone shows the lesions. Histologically, the few sections made so far show circular hemorrhages with a necrotic center situated around small vessels, while the periphery of the necrosis is surrounded by agglomerations of large cells, which also embrace the extravasated blood corpuscles. In other cases there is but a simple destruction of the substance of the brain by the extruded red cells. There were no pronounced inflammatory lesions. Of the seven brains examined bacteriologically, in two very small diplococci were found, which grew on blood agar like *B. influenzae*. The author questions, however, their etiologic significance. In spite of some disparity in pathologic findings, the author considers the infection to be real influenza, but he rejects Pfeiffer's bacillus as its cause, since it was found in the bronchial mucus in only three out of his fifty cases.

The other authors add few important observations. Simmonds maintains that the only difference as against the 1890 pandemic consists in the more frequent occurrence of secondary streptococcic infection. Bacteriologically he found *B. influenzae* in both the sputum and the postmortem material, "very frequently." Hirschbruch found *B. influenzae* in one case, the remaining fifteen being associated with cocci. Gruber and Schädel insist on the frequency of periarteritis and panarteritis, and note an acute dilatation of the right heart in most cases, a finding identical with that of Hammond, Rolland and Shore (see above). Diplostreptococci were the only bacteria found by them. Bergmann never found Pfeiffer's bacillus in postmortem material.

The observations made by Dietrich in the field deserve special mention. *B. influenzae* was recovered from the first seven postmortem examinations and identified as such by Neisser. They were found during the acme of the process in the alveoli, between the leukocytes or under the epithelium, or again in small mucous plugs occluding the bronchioli; there were none or very few in a multitude of other species in the trachea. The more advanced the lesions the more complex their bacterial form. In his opinion, Pfeiffer's bacillus was the "pioneer" of the lesions, while the secondary infections proved fatal. He denies the occurrence of a status thymo-

lymphaticus and believes that the exertions of the service, wounds, etc., prepared a disposition in his cases. Hemorrhagic diathesis of the tissues and very frequent findings of streptococcic meningitis and endocarditis differentiate his results from that of the other authors. He also agrees with the assumption of a primary affection of the vessels, but it is *B. influenzae* which in his opinion inflicts the damage, being also responsible for the edematous purulent bronchitis and thus forming a favorable basis for the subsequently fatal secondary infections.

Bernhardt and Meyer divide their twenty-eight cases into three categories: (*a*) Six severe hospital cases in which there were other affections and which were secondarily infected with influenza; (*b*) seven mild hospital or outside cases weakened by the previous illness; and (*c*) fifteen healthy individuals or surgical patients who were admitted to hospital for influenza. In this way the authors claim to have been able to watch the progressive development of the pathologic process, which in no way differs from that described by Oberndorfer. The inflammation of the intima in pulmonary arteries was noticed in one case. Encephalitis was present once, but it was a purulent hemorrhagic inflammation. Perichondritis arytenoidea and hemorrhages into, and swelling of, the suprarenals were among occasional findings. On the whole the process was localized almost entirely in the lungs and in the pleura in conformity with the experience of the 1890-1892 pandemic. *B. influenzae* was found in no instance, the majority of the cases yielding a pure growth of diplostreptococci which were obtained from the lungs, the heart blood, spleen and liver. It is difficult to decide whether all the strains belong to the same species. They tend to degenerate in involution forms; the virulence for mice varies from strain to strain and from culture to culture, to the extent of 0.001 c.c. to 0.1 c.c. of a broth culture by intraperitoneal injection. There may be, however, a relative unity of species in view of the contagiousness of all the strains and the explosive character of their transmissibility in a given group of patients (a hospital ward, barracks, etc.). The organisms must be regarded as companions of the unknown primary agent of the pandemic, the epidemiologic and pathologic symbiosis being regulated by definite biologic laws. In any case the cocci are of decisive importance for the pathogenesis of bronchopneumonias and all fatal complications.

Bernhardt previously examined forty-seven acute cases during life, and while failing to isolate *B. influenzae* from any, he regularly recovered from the cultures of the posterior throat and the expectorated mucus the same diplostreptococcus in enormous numbers and often in an almost pure condition. In direct films they are frequently intracellular, mainly in twos, sometimes in thick groups or in whole chains of four to six members. Minute in size, they appear oval or round, an impression of a capsule being at times conveyed. Growing sparsely on ordinary agar, they give on ascitic agar very small, translucent, round, sharp-edged, flat colonies which do not become confluent, however abundant the film. On human blood agar the very minute colonies seem to avoid the portions with deep layers of blood. They are hemolytic if not more than one twentieth to one thirtieth of blood is added, changing the color to a black greenish tinge like *Streptococcus mitior*. The cultures are not soluble in bile. Distinctly gram-positive, the organisms tend to involute, longish chains being met with composed of single cocci varying in size within one chain or in different chains in one field, so much so that an impression—proved experimentally to be erroneous—of a mixed growth is obtained. From glucose broth two varieties of colonies develop: a typical, delicate, clear and a thicker slimy colony which consists of twelve to fifteen membered chains. The cultures are not very viable, twenty-four to forty-eight hours sufficing to reduce greatly the abundance of subgrowth. Ascitic broth cultures are virulent to mice. In normal controls the organism is not encountered or is extremely sparse if present. Patients while coughing conveyed the organism to a distance of at least 50 cm., the colonies growing on exposed plates in groups of ten to fifteen. Such experiments were negative with convalescents after the fall of temperature. The diplostreptococcus is very aptly designated by Bernhardt as *Diplococcus epidemicus*. It bears most resemblance to *Streptococcus conglomeratus*.

Mandelbaum, who investigated bacteriologically Oberndorfer's cases, recovered streptococci in twenty-five, pneumococci in three, staphylococci in two, and *Streptococcus mucosus* in one case from the bronchial secretion on postmortem examination. He does not specify the characters of his cultures, which he considers all as secondary infective agents equally responsible for the lesions. He denies emphatically the causal relationship of Pfeiffer's bacillus to influenza. It should have been present in the lungs if it were the agent of the pandemic. The remarkable immunity of the groups of population over 30 clearly indicates a survival immunity to influenza, whereas classical experiments of Delius and Kolle had shown that Pfeiffer's bacillus is incapable of inducing active immunity in the animal body. It has been often isolated since 1892 in various countries, and yet there was no pandemic, in spite of its ubiquity. Thus other factors must be responsible for the outbreak of influenza.

Selter also failed to find *B. influenzae* in the sputums of thirty-three cases examined at Königsburg, although the cultural investigations were carried out with all care and rapidity. He does not consider Bernhardt's *Diplococcus epidemicus* to be the agent of pandemic. It belongs to the group of pneumococci, and is no doubt transmissible with the real virus. This—he agrees with Kruse—belongs most likely to the family of aphanozoa, invisible microbes, for it is striking that Pfeiffer's bacillus met until 1904 in many outbreaks was entirely absent from the big epidemic of 1908 in western Germany and France. He submitted himself and his woman assistant to an interesting experiment: their throats were sprayed for one-half minute with a saline filtrate of throat swab and throat washings of several patients. Both of them developed a typical though mild attack of influenza.

Kroner, Kisskalt in Kiel, Friedemann in Berlin, Kolle in Frankfort and Hirschbruch at Metz have failed to isolate *B. influenzae*. Kolle, it may be remembered, found a diplococcus apparently identical with that of Bernhardt.

Gruber and Schädel occupy an intermediate position. Of the 250 cases examined at Mainz they found *B. influenzae* only in fourteen, while from the overwhelming majority diplostreptococci were recovered. Bergmann found both the pneumococcus and *B. influenzae* at Marburg, the latter being isolated in a high percentage, in fifteen out of the twenty sputums examined. The strains were identified on the basis of the few typical characteristics. Pfeiffer (*Medical Supplement*, 1918, **1**, 306) has so far confined his observations to a short note stating that the inconstant finding of his bacillus was still under investigation. Simmonds reported very frequent findings of Pfeiffer's bacillus at St. George's Hospital at Hamburg, while Dietrich isolated regularly *B. influenzae* in the field, and had his cultures identified by Neisser. Gotschlich obtained 12 per cent. positive cultures from a series of twenty-three sputums in Giessen.

Uhlenhuth, a "die-hard" of bacteriologic orthodoxy, has clearly shown signs of uneasiness. Two series of cases were carefully scrutinized. In one group of fifty-one, "suspicious" bacteria were seen in direct films in 66 per cent. of specimens of sputum, the cultural recovery being limited to 13 per cent., while in addition one empyema and one throat swab yielded the looked-for growth. In a second group of forty-seven, eighty-four sputums were examined, and thirty-three cultures obtained from twenty-two cases, a percentage of recovery equaling 46.8. Blood cultures were uniformly negative. Thus Uhlenhuth cautiously concluded that *B. influenzae* is detectable in "not inconsiderable numbers." Yet he admits the extraordinary scantiness of the bacilli in films, although he blames the young bacteriologists for either not knowing how to recognize Pfeiffer's bacillus or inversely for producing, when challenged, cultures of any small gram-negative bacillus as *B. influenzae*.

He believes that experimental transmission of the disease should be tried; he himself failed to infect a monkey with Pfeiffer cultures, and shrank from experimenting on man in view of the danger of a complicating pneumonia. No "urgent reasons" exist in his opinion for abandoning the conception

of the etiologic importance of *B. influenzae*, and he warmly recommends the use of the new mediums advocated by Levinthal.

Levinthal, some months before the epidemic started, set out to strengthen Pfeiffer's concept of influenza by raising the percentage of positive recoveries from sputums. It is admitted on all hands, and it has also found expression in the reports of the skeptics, that *B. influenzae* is notoriously difficult to cultivate even from a material microscopically swarming with it.

Symbiotic cultivation, particularly in a mixture with staphylococci, was experimented with many years ago, and furnished valuable indications as to the biology of the microbe, but did not prove a helpful means for routine diagnosis. It is, of course, a commonplace of bacteriology that *B. influenzae* thrives on hemoglobin and its break-down products and not necessarily on fresh blood. Guided by this, Levinthal concocted a new medium by adding fresh blood in a proportion of 1:20 to melted sterilized faintly alkaline agar, and, after thoroughly mixing, by boiling the whole for a few minutes, and then bringing it twice more to the point of ebullition. The blood clots and reclarifies the medium, which should now be filtered aseptically through gauze or paper, and kept ready for use in deep test tubes. The resulting agar is perfectly transparent, and grows *B. influenzae* in giant absolutely translucent colonies.

The yield is increased very considerably, the filamentous pseudoforms of the bacilli revert to the type, and, more important still, the cultures emulsify readily and keep in suspension without clumping spontaneously. Thus a basis was obtained for the application of the agglutination test as an additional means of diagnosis. Levinthal claims that live cultures on his medium produce highly specific potent serums when injected into rabbits, and that inversely patients or convalescents, but not controls, agglutinate his emulsions electively in dilutions of one fiftieth to one four-hundredth.

While highly praising the enriching qualities of this medium, Uhlenhuth was unable to confirm the virtues of the suggested "influenza Widal," which seems to have passed unheeded in the German literature.

. . . . . .

The story breaks here at present, and although Pfeiffer may yet furnish reasons why the verdict should not be pronounced, there is already sufficient material to shake the orthodox conception out of its high altar. Two facts stand out prominently: the generally acknowledged, or by some reluctantly admitted, absence of *B. influenzae* from the organs on postmortem examinations, and the universally recorded findings of diplostreptococci, singly or in association with the Pfeiffer bacillus.

DISCUSSION

The Pfeiffer conception, robbed of all hypothetic superstructure, rested in its essence on the fact of the obvious intimate relationship between bronchopneumonic lesions and the—practically never absent—bacilli. In 1892-1893 it was already reported that sputums may yield negative results; but the postmortem findings silenced the critics, who were persuaded that it was only faulty technic and capricious eccentricity of an unusual organism which vitiated the otherwise perfect harmony of theory and histologic pictures. Some few fossils of the heroic epoch never admitted defeat, and one of them, Hueppe, in an open letter to the *Deutsche medizinische Wochenschrift*, triumphantly points to the present negative findings as confirming his unabated disbelief in the etiologic significance of the hemophilic bacillus.

Doubtless the present outbreak deviates in certain particulars from the last pandemic. First, the age incidence is remarkable, and it must frankly be conceded that the hypothesis of a "survival immunity" is not convincing, since similar factors should have operated twenty-seven years ago, when they did not. One should rather agree with Lubarsch that the disturbance of the war has caused a profound alteration in the normal course of the epidemics. Indeed, there is the precedent of poliencephalomyelitis, which many authors sought to differentiate from the Heine Medin concept on the basis of an unusual age incidence. Secondly, the blood picture is not one of leukocytosis, as classically described. Levy, at the Berlin Charité, came to conclusions corresponding with the English experience, namely, that there is leukopenia at the expense of polynuclears, the lymphocytes and large mononuclears increasing proportionately, the latter reacting sometimes even 21 per cent. of the total. Leukocytosis should be regarded as a sign of complications, while complicating infections without it are prognostically ominous. Thirdly, there is the seasonal difference (spring and not autumn), and the apparent western origin of the explosive outbreak. As to that, great caution is indicated. The whole globe being at present a "ward in censorship," it is not possible to decide whether the present is a European or a world pandemic, a problem of great importance in view of the seemingly varying cycles of the two (twenty to thirty to forty to fifty years), a circumstance which might throw light on factors regulating the immunity. Neither is the western origin to be taken as granted. Ginns, at the Medical Society of Berlin, suggested that the virus might have been imported by Chinese laborers, employed behind the front, while Legroux of the Pasteur Institute stated in the public press that the "Spanish" disease made its first appearance in the area of Dunkirk, and only thence traveled southwest. The absence of prodromal catarrhal symptoms may be explicable by the unusual season of outbreak, and it is to be feared that epidemiologic purists may yet obtain satisfaction at seeing a much graver catarrhal form during the second tide, which already had begun to rise in Spain and in Sweden, as well as in Italy, as an apparently more severe illness.

Without laying too great a stress on the (so far) scanty publications from the field, it cannot be denied that *B. influenzae* was more often recovered from troops in the battle zones, who seem to have been subjected to a much milder type of attack. It is interesting to note that the Budapest clinic claimed to have isolated the Pfeiffer bacillus from every case examined—a fact which, if correct, might be correlated with the observations from the fronts.

The cold logic of the postmortem room in the dispassionate home surroundings does not leave, however, any doubt that Pfeiffer's bacillus when present did not play any more important part than the ubiquitous diplostreptococci. The real virus classified "faute de mieux" as "invisible" or a "filter passer," so as to cloak our ignorance of its nature, remains to be discovered.

THE DIPLOSTREPTOCOCCI

The diplostreptococci, although secondary in point of time and apparently primary in deciding a fatal issue, seem to be transmissible from man to man equally with the main virus. The observation that bronchopneumonias tend to spread in the wards of fever hospitals was made years ago, and there are institutions, as, for example, the Plaistow fever hospital, which include the disease in their list of infections to be "barriered." The remarkable frequency of fatal pneumonias during the last three years has been commented on. It seems to have risen again some two months before the first tide of this pandemic almost all over Europe. It was characterized by the circumscribed character of the outbreaks and by a preference for attacking young, vigorous men. There is room for inquiry whether these isolated epidemics were not the brewing ground, the preparatory drum fire, preceding the general assault by the main virus. It may cause surprise that these bacteria were not universally encountered before, or that, if met with, no significance was attached to their presence. But, first, there has been growing of late a tendency for disregarding organisms of the textbook type as mere obsolete formations, a sort of background scenery amid which the real virus must hide somewhere in its commonly assumed invisible form. Secondly, with a few exceptions, these diplococci remain unclassified both on account of the unsatisfactory or insufficient standards of identification, and of the deplorable multiplication of researchers who have invaded laboratories with a very inadequate scientific equipment aggravated by a firm refusal to practice modesty of conclusions, or to observe elementary accuracy in recording observations.

A breadth of outlook is also a necessity. The cyclical appearance of epidemics causes no surprise, but it is obviously based on a (so far) unaccountable periodic visitation of the globe by unusual bacteria. It may be that the diplococci are the novelty of the present season, condemned to oblivion after the ebb and flow of influenza and its companions will subside, and Bernhardt's designation of *Diplococcus epidemicus* is a fitting provisional label. Among the companions of "grip," epidemiology records almost regularly coincident epizootics among horses. There are two varieties: the "pink-eye," the *Pferdestaube*, or *Druse*, strangles of English and *gourme* of French authors, a coryza contagiosa equorum clinically manifesting itself as an influenza catarrhalis, and the pneumopleurisy, *Brustseuche*, an influenza pectoralis. Now, the latter infection gives anatomic pictures closely resembling those of the present pandemic. Purulent fibrinous bronchitis, bronchopneumonias, swelling and suppuration of lymphatic glands, as well as the lightning character of the outbreak and the prevalence of the first catarrhal variety on the onset, make of this epizootic an analogous infection. Some authorities hold that the two epizootic types are distinct "entities," and the *Streptococcus equi* of Schütz has been long ago identified with strangles, while the French school of Lignières associates *B. bipolaris-equisepticus*, a member of the manifold group of "Pasteurella," with the pneumopleurisies. The strangles has been lately transmitted from horse to horse by means of filtrates of infectious material, while Gaffky and Lührs have infected horses with inflammatory mucus of the pneumopleurisy at a stage of its microscopic sterility. There is complete unanimity, however, that the two bacteria are commonly found in the excretions and organs of the exudative inflammatory period of suppuration. Now *Streptococcus equi* in microscopic morphology and type of growth strikingly resembles the diplococcus of Rosenow, and most likely the *Diplococcus epidemicus* of Bernhardt. As to *Bacillus bipolaris-equisepticus*, morphologically it is indistinguishable from some of the gram-negative bacilli described by certain authors mentioned above as Pfeiffer's bacillus deviating from the type. It is not, however, hemophilic, and grows easily on ordinary mediums. It is undeniable, nevertheless, that during the present pandemic bipolar gram-negative, delicately growing, and nonhemophilic bacilli were often isolated from the organs. Hirschbruch, who regards these organisms as most likely corresponding with the bacteria of the human infections, draws attention to the fact that neo-arsphenamin, a proved remedy for the epizootics, has been successfully applied in Switzerland in the treatment of severe cases during the present pandemic. The Swiss have also isolated Pfeiffer's bacillus only occasionally, and also dwell on the presence of secondary diplostreptococcic infections.

Thus a fruitful field for research is opened in many directions. It is, unfortunately, only too certain that a second and more severe wave of influenza will spread over Europe in a few months. The results of the experience gained so far suggest that active immunization, both for prevention and treatment of the grave complications, with the diplostreptococci should be attempted. Streptococcal serotherapy might also be tried. A large group of several hundreds of cases should be thoroughly investigated by a team of workers—clinicians, bacteriologists, morbid anatomists and epidemiologists—working in correlated agreement. Experimental transmission to animals should enter in the scheme, while cultures obtained from various districts should be sent for classification and comparison to the main working center.

The team of workers would doubtlessly remember that "it is the property of things seen for the first time, or for the first time after long, like the flowers in spring, to reawaken in us the sharp edge of sense and that impression of mystic strangeness which otherwise passes out of life with the coming of years."

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Rest and the Tuberculosis Patient.—The influence of rest in abating the severity of an inflammatory process is well known. The effect of motion and of friction in spreading infection from a suppurating focus is a familiar surgical fact. Not only should deep breathing be avoided in the tuberculous patient but motion of the upper extremities should be reduced to a minimum. Rest is also highly desirable to promote a cicatrization and encapsulation. And lastly rest of the body is needed for its recuperation. Psychic and physical relaxation should both be practiced. The neurasthenic tuberculous patient with the anesthesia of fatigue or the restlessness of the overfatigued who are "too tired to rest" must learn to rest and relax not only to recreate his energy in some measure, but to store it up. Rest must be the only means associated with the outdoor life so far as is practicable.—*Amer. Rev. of Tuber.*

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SATURDAY, NOVEMBER 9, 1918

OBSERVATIONS ON THE PRESENT EPIDEMIC OF SO-CALLED INFLUENZA IN EUROPE

The highly interesting abstract of recent English and German articles on so-called epidemic influenza, prepared by the British Medical Research Committee and printed verbatim in this issue of The Journal,[1] invites a few brief comments. The abstracts do not convey any clear information as to the extent of the spread or the severity of the disease in Europe. Judging, however, from the number and the nature of the articles abstracted, it looks as if the disease, thus far at least, has been more severe and more extensive in Germany than in England. One also receives the impression that the results of the bacteriologic and anatomic studies in Germany correspond more closely, perhaps, to the results that are being obtained in this country than do those coming from England. But it is entirely too early, of course, to form any reliable conclusions.

The articles abstracted seem to have been meager in clinical detail. It is evident that the observations at hand do not indicate the present epidemic to be a distinct clinical entity, clearly differentiated in its clinical activities from similar previous epidemics of more limited extent. The present epidemic apparently differs from these earlier epidemics mainly in contagiousness and in its extensive spread. The many minor epidemics of respiratory infections preceding the present epidemic are of great epidemiologic interest, but their true relation to the European influenzal disturbance can probably not be traced accurately. The fundamental anatomic changes in influenza, according to the German reports, seem to have been hemorrhages, especially in the respiratory tract, as well as inflammatory foci, the whole suggesting to some of the investigators a primary infection of the blood with localization especially in the pulmonary vessels. It would seem, however, that the possibility of direct infection of the respiratory tract cannot be excluded. These changes are regarded as paving the way for secondary infections. It is of great interest that there is no unanimity of opinion whatever as to the nature of the primary infecting agent.

The bacteriologic results do not appear to warrant the assignment of any greater importance to the influenza bacillus than to the organisms described as diplostreptococci. These diplostreptococci are not described fully, but they most probably are nonhemolytic streptococci of the viridans type. Only slight mention is made of hemolytic streptococci or of pneumococci, which appear to be isolated in a certain proportion of the cases of influenzal pneumonia in this country.[2]

On the whole, the results of the work covered by the abstracts support the conclusion that we do not understand the true nature of the condition now being called epidemic influenza; that there is not sufficient evidence to regard any one of the different forms of bacteria found in the respiratory tract in the cases of the disease as the primary cause, but that all the bacteria, the influenza bacillus, as well as the so-called diplostreptococci and others, may be secondary invaders, transmissible from person to person with almost the same ease as the supposed, but unknown, primary cause. The one experiment mentioned bearing directly on the question of the exact etiology of epidemic influenza is that by Selter, who produced a typical but mild attack in two persons by spraying the throat with a filtrate of influenzal throat secretions; but not enough details are given so that one can form any judgment as to the value of this experiment.

1. Page 1573.

THE REDUCTION OF BODY WEIGHT IN WAR TIME

Reports that have reached this country from Germany at intervals since the beginning of the world war have indicated that the unquestioned shortage of food has not been without effect on the civil population. It has been freely stated that a loss of body weight has in many cases followed the reduction in the available food. In some quarters the lowered intake necessitated by the emergency, particularly a year or more ago, has been hailed as a change by no means disadvantageous to the organism. "We eat too much," according to the dictum of those enthusiasts who see only advantage in an enforced dietary economy for a large part of the civil population, particularly for the great number of sedentary persons whose energy demands are primarily determined by the routine necessities of life rather than by muscular work of an arduous sort.

Since the American people have also been called on to exercise economy and avoid dietetic extravagances, it is timely to ask what the available evidence justifies

2. Nuzum, J. W., et al.: Pandemic Influenza and Pneumonia in a Large Civil Hospital, this issue, p. 1562. Strouse, S., and Bloch, L.: Notes on the Present Epidemic of Respiratory Disease, this issue, p. 1568.

us in concluding on the subject of reduced rations. There seems to be little doubt that the rumors of reduction in body weight are not without foundation. Loewy,[1] a Berlin physiologist of experience in the study of nutrition, reported some time ago, as the result of statistical inquiries made by him, that already in April, 1916, the restriction in the food intake among large groups of the population was represented by an energy intake of between 2,200 and 2,300 calories a day, with an average protein content of from 65 to 68 gm. Loewy believed that such a regimen may be adequate in respect to its quota of protein, but that the energy that it represents would in general scarcely satisfy a sedentary person.

Since then a significant confirmation of the effect of the war time diet on the weight of the average German male citizen has been disclosed through the authority of Prof. Friedrich Müller, the Munich clinician. He has reported that in Munich men under 50 years of age had experienced an average loss of weight amounting to 10 per cent. in the two years preceding 1918. This leads his assistant, Dr. Jansen,[2] to remark that the former norm of 70 kg. for the adult man must be regarded as represented by 60 kg. in 1917 in Germany. Among a group of medical students examined by Jansen in the spring of 1917, all had experienced losses of weight amounting to 4 or 5 kg. during the war.

Such experiences raise the question as to the actual effect of a prolonged and considerable reduction of the diet on the metabolism. Since the law of the conservation of energy applies in the human organism, the food requirement must be equivalent to the metabolism in any event. Is this a fixed factor, so far as the maintenance component is concerned, or does it become altered with changing planes of nutrition? When the body weight declines as a result of short rations, is a point of equilibrium finally reached at which the scant supply suffices? To answer such pertinent questions Jansen has made observations on men averaging 62 kg. in weight and kept on restricted diets including 60 gm. of protein and 1,600 calories a day. The basal metabolism of these persons (at rest without food) averaged 1,400 calories. On the limited food intake there was continued loss of protein, amounting to nearly 12 gm. a day. When an additional 500 calories in the form of carbohydrate (lactose) were fed, the loss of nitrogen was nearly averted, showing that when enough total food energy is furnished, 60 gm. of protein in the daily diet may suffice to prevent loss of nitrogen from the tissues.

So far as the observations on the minimal protein requirement are concerned, there is nothing essentially new in these findings. It has repeatedly been demonstrated that the conventionally assumed requirement of more than 100 gm. of protein a day is unnecessarily high in the light of modern researches. The energy features of the restricted diets cannot be so lightly dismissed. After reduction in body weight there was a lowered basal metabolism, which Jansen, like Loewy and Zuntz,[3] attributes to a decrease in the active cell substance of the body. The persons involved were far from comfortable on the restricted diet; and when the task of a long march was further imposed on them, symptoms of distress ensued. In other words, the scanty maintenance diet of 2,100 calories for an adult man leaves no factor of safety for vigorous physical exercise.

In this country, Benedict[4] and his co-workers at the Carnegie Nutrition Laboratory in Boston have made somewhat analogous, though far more elaborate studies on the effects of a prolonged reduction of diet on twenty-five men. A gradual reduction in weight to a point 12 per cent. below the initial weight took place during a period of from three to ten weeks, with low calories and a moderate amount of protein in the food intake. The normal demand of the men prior to the dietetic alteration ranged from 3,200 to 3,600 net calories. One squad of twelve men subsisted for three weeks on 1,400 net calories without special disturbance. Benedict states that notwithstanding the great reduction in the metabolism (which he believes was due to the removal from the body of the stimulus to cellular activity of approximately 150 gm. of "surplus nitrogen"), the whole period of lowered food intake had no untoward effect on the physical or mental activities of these men, and they were able to continue successfully their college duties. The psychologic report concludes that a prolonged reduction in diet produces some decline in neuromuscular activities, but this does not seem nearly so definite or so large as the changes in metabolism and allied measurements. The psychologic changes were not such as materially to interfere with a satisfactory discharge of the common duties of student life.

Seemingly in contrast to the German experience, Benedict's carefully selected subjects were less distressed by the privations of the diet. The measurement of their metabolism in walking showed a marked saving in the energy requirement for walking in favor of the reduced diet, whether considered on the basis of the gross energy expended, which represents the real cost to the individual and to the national food reservoirs, or on the basis of the energy required per horizontal kilogrammeter. Nevertheless it will be wise, in view of conflicting statements, to hesitate to lower

1. Loewy, A.: Deutsch. med. Wchnschr., 1917, Nos. 6 and 7.
2. Jansen, W. H.: Untersuchungen über Stickstoffbilanz bei kalorienarmer Ernährung, Deutsch. Arch. f. klin. Med., 1917, **124**, 1.
3. Loewy, A., and Zuntz, N.: Berl. klin. Wchnschr., 1916, No. 30.
4. Benedict, F. G., and Roth, P.: Effects of a Prolonged Reduction in Diet on Twenty-Five Men, I, Influence on Basal Metabolism and Nitrogen Excretion, Proc. Nat. Acad. Sc., 1918, **4**, 149. Miles, W. R.: Effects of a Prolonged Reduction in Diet on Twenty-Five Men, II, Bearing on Neuromuscular Processes and Mental Condition, ibid., p. 152. Smith, H. M.: Effects of a Prolonged Reduction in Diet on Twenty-Five Men, III, Influence on Efficiency During Muscular Work, ibid., p. 157.

the body weight of the populace at large to any considerable extent by rationing measures for the debated advantage of greater efficiency. The significance of "surplus protein" has not yet been clearly defined.

MORE MILK FOR VITAMINS

More than ten years ago the English physiologic chemist, F. G. Hopkins,[1] had found experimentally that an animal cannot live "on a mixture of pure protein, fat and carbohydrate; and even when the necessary inorganic material is carefully supplied, the animal still cannot flourish." In connection with these investigations he made the important discovery that a surprisingly small amount of milk as well as extracts of some other natural foods confer a nutritive adequacy on the otherwise insufficient ration. Meanwhile Osborne and Mendel[2] in this country demonstrated that the residual part of milk from which its fat and protein had been removed exhibited a growth-promoting or nutrition-promoting property when it was added to mixtures of the purified familiar foodstuffs. Subsequently McCollum and Davis and Osborne and Mendel independently announced that the fat of milk (butter fat) also exerts a further growth-promoting influence presumably due to something different from the known fats but closely associated with them. Thus the significance of the vitamins—a water-soluble and a fat-soluble type, respectively—in milk became established.

These discoveries have since been verified for various species. The lack of either the fat-soluble or the water-soluble essential properties has been believed to lead to distinct pathologic consequences when these vitamins are not replaced from other sources in the diet. Conversely, the presence of these "specifics" for good nutrition and growth contributes in no small measure to make milk the unique food that it is justly regarded to approximate. Hence we can understand what Mrs. Rose[3] intended to imply by this fanciful comment: "When the milk pitcher is allowed to work its magic for the human race, we shall have citizens of better physique than the records of our recruiting stations show today. Even when the family table is deprived of its familiar wheat bread and meat, we may be strong if we invoke the aid of this friendly magician."

Osborne and Mendel[4] have more recently come to the conclusion that from a quantitative standpoint cow's milk is not as rich in the water-soluble vitamin as one not familiar with the experimental evidence for this property of the food might assume. This is in no sense to be construed as a denial of the "magical qualities," but rather as an argument for the more liberal use of milk when it is relied on largely to contribute the growth-promoting factors in the diet. From a practical standpoint it appears not unlikely, to cite the warning of Osborne and Mendel, that the need of children and other growing animals for the water-soluble vitamin, beyond the earlier stages of development when milk admittedly satisfies the nutritive requirements, may not be adequately filled by some of the current or enforced dietary practices. Thus, they add, with a too scanty allowance of milk, a liberal inclusion of products from cereals rendered poor in vitamin by milling, of sugar, fats, and few additional animal products other than meat (which has been shown to contain relatively little of the water-soluble vitamin), it is not surprising if disasters sometimes manifest themselves.

Another aspect of the significance of their quantitative studies of the vitamins in cow's milk has been presented by Osborne and Mendel in relation to milk dilution in infant feeding. It is a common practice to reinforce the supply of calories by diluting top milk and adding lactose. Under these circumstances, we are reminded, the child is supplied with a food that contains a relatively smaller proportion of the water-soluble vitamin than does the original cow's milk. While milk thus modified may contain sufficient vitamin as long as the food intake is normal, if for any reason the child's appetite fails, the vitamin supply is reduced and endless dietary troubles may easily result.

Without attempting to evaluate the actual degree of danger attributable to such causes in the artificial feeding of infants, we may well bear in mind the potentialities for harm. It may be that the young of healthy mothers are born with a reserve supply of the so-called vitamin substances sufficient to maintain them in good nutritive condition until the time when they begin to eat other foodstuffs. If milk is not always as rich in vitamins as is desirable at later stages of growth, there may be real wisdom in the practice of extending the diet as soon as the physiologic conditions of the individual warrant the use of other foods.

1. Hopkins, F. G.: The Analyst, 1906, **31**, 395.
2. Osborne, T. B., and Mendel, L. B.: Feeding Experiments with Isolated Food Substances, Pub. 156, Carnegie Institution of Washington, Parts I and II, 1911.
3. Rose, Mary Swartz: Everyday Foods in War Time, 1918, p. 11.
4. Osborne, T. B., and Mendel, L. B.: Milk as a Source of Water-Soluble Vitamine, Jour. Biol. Chem., 1918, **34**, 537.

Training in Occupation Therapy.—A new course of instruction has been established by Columbia University in the School of Practical Arts in the Teachers' College for the purpose of training women in occupation therapy. The instruction will be given by specialists in nervous and mental diseases. In order to obtain a diploma, seven courses are required, comprising the medical aspects of occupational therapy, the methods of teaching this treatment, observation and practice work with the patients in institutions, the elements of psychology, art structure or design, and at least two craft courses. It is important that those taking up this work be of the normal, wholesome, well balanced type, with vigor and physical endurance. Other requisites for this branch of service are: First, the teacher should understand sick people. In the second place, she should have the psychologic background for teaching, and finally, she should be skilled in the arts and crafts.

Current Comment

VALUE OF VACCINATION AGAINST INFLUENZA

We publish in our Correspondence Department in this issue an interesting letter with the above title. In it the author apparently takes it for granted that the influenza bacillus is the primary cause of the acute epidemic respiratory infection now pandemic and being generally called influenza. There is no conclusive evidence that the Pfeiffer bacillus plays any greater rôle, if as great, in the present epidemic than any other bacteria found in the respiratory tract in this disease. This point emerges very clearly in the abstract of recent English and German literature and in the original contributions printed in this issue. We would also emphasize that, so far as we know, the influenza bacillus is a very poor antigen; there is, in fact, nothing to show that definite antibodies against this bacillus develop in the course of influenza, and the results of animal experiment show that it requires prolonged immunization before any response becomes apparent. Again, we have no record of any properly conducted and controlled experiments on human beings with influenza vaccines. No results of careful observations are as yet at hand. These things being so, what should a fair-minded and thoughtful physician say as to the face value of influenza vaccine? In this connection we give two examples of so-called "evidence" that appeared in newspapers, which seem to be the medium through which most of the evidence is appearing. One appeared in the health department, conducted by a physician, of a metropolitan newspaper in the middle west under the utterly misleading heading "Vaccine Blots Out 'Flu.'" We quote:

> The evidence of the efficiency of the treatment is this: On October 20, about half the population of a town of 10,000 had been vaccinated at least in part. There have been seven cases of the disease. All the cases were among unvaccinated people. In a nearby town, with 400 inhabitants, there have been 200 cases and fifteen deaths. In the asylum three cases developed. Everybody was vaccinated and the disease did not spread. In St. Mary's Hospital the disease got a foothold among the doctors and nurses. After vaccination the disease stopped at once.

The other appears in an eastern paper as an interview with a physician, who, incidentally, is a manufacturer of vaccines, although this vital fact does not appear in the item. Again we quote:

> I think it but just that I should report the success I have had in treating and preventing Spanish influenza with vaccine. I have given over 1,000 inoculations with 100 per cent. protection and treated several hundred cases with no deaths. Prior to the time I used vaccine nearly every one exposed to the disease contracted it. Now I blot it out of every house at my first visit by inoculating the entire family.

This so-called evidence has not yet been submitted in any scientific manner with the necessary facts and details to permit any judgment whatever to be formed as to its true value. In the meantime, we should not forget that in its natural course, epidemic influenza is affecting different, even adjacent, communities with widely varying degrees of severity, and that vaccination in an institution after the disease has appeared can have no value as an experiment because it may have been done in the wane of the epidemic. Finally we repeat: Vaccination against epidemic influenza is in a wholly experimental stage. Nothing can be learned as to its real value from indiscriminate vaccination of the public. The physician who, in view of the severity of the epidemic, feels that he is justified in vaccinating his patients, should be fair to them and protect himself by informing the patient that he regards the procedure as wholly of an experimental nature. Pending developments, nothing should be done by the medical profession that may arouse unwarranted hope among the public and be followed by disappointment and distrust of medical science and the medical profession.

EMERGENCY EDUCATIONAL STANDARDS AND STATE LICENSURE

Thirty-two state licensing boards either in the practice laws or by board rulings require that, before entering on the study of medicine, the student must have completed two years of premedical college work. This requirement as usually interpreted means sixty semester hours of work taken in two annual sessions of nine months each, and usually the two sessions are separated by a summer vacation of three months, making a total in actual time of twenty-two months. Divided into "quarters" of three months each, this would require seven quarters. Now, as noted in THE JOURNAL recently,[1] the Committee on Education and Special Training of the War Department has decided not only to do away with the summer vacation but also to condense the work of the remaining six quarters into four, or into a continuous session of twelve months. This means that the student will have to work proportionally harder at his professional studies; but with the rigid military routine there will be more time at his disposal than in the haphazard time-wasting methods of the former régime. The physical exercise required in the eleven hours per week of military drill will help to keep the student physically fit for the extra mental effort required of him. The object hoped for is to secure an equal amount of valuable training in two thirds of the time heretofore spent in obtaining it. The important question for licensing boards to decide is whether they can legally accept this course as the equivalent of the preliminary education required in their respective states, when these students apply for licenses. Based on correspondence conducted by the Council on Medical Education, nearly all the boards that were given ample authority by their practice acts stated their intention to cooperate with the War Department to the fullest extent possible in any measures made necessary by war conditions. In a few other states, amendatory clauses may need to be inserted in the practice acts so as to provide for graduates who began the study of medicine under these special regulations laid down by the War Department. This condensed schedule may, in fact, lead to permanent changes and important

1. Schedule of Studies for Premedical Students, Current Comment, THE JOURNAL A. M. A., Oct. 19, 1918, p. 1317.

improvements both in methods of teaching and in state board requirements. There may, indeed, be an awakening to the fact that much valuable time heretofore has been lost to the student through the adherence to long obsolete arrangements of college curriculums as well as in the time wasted in the long summer vacations. If what has heretofore required six or seven years can be completed in four or five, the two years saved of the average student's time will make some changes in medical license regulations well worth while.

PASSING THE INFLUENZA BUCK

The Madrid correspondent of THE JOURNAL in his letter in this issue wishes it clearly understood that Spain does not care to take the responsibility for having initiated the present epidemic of respiratory disease. His protestations are both informing and amusing. Our Paris correspondent, also in this issue, feels too that the onus of responsibility should not be placed on Spain since the epidemic occurred both in France and in Germany. As one views the devastation which the disease has caused he is inclined to sympathize with the efforts of Spain or any other country to pass the buck.

ESSENTIAL TEACHERS AND THE DRAFT

Lists of essential teachers have been furnished by deans of well recognized medical colleges to the Surgeon-General of the Army and, as stated in a previous comment,[1] these teachers are not to be commissioned but are being retained at their teaching duties. But this arrangement does not exempt essential teachers of draft age from the requirements of the Selective Service Regulations. Such teachers, therefore, when filing their questionnaires should ask for a deferred classification on the ground that they are engaged in an activity "necessary to the public welfare and to the prosecution of the war." And whether the registrants ask for the deferred classification or not the deans of the medical schools should claim for their essential teachers this deferred classification in accordance with the Selective Service Regulations. While, as stated in one of their extracts, "it shall be the duty of advisers to confer with the managers and heads of various industries"—and this means, also, deans of medical schools—experience shows that the initiative usually has to be taken by the deans of the schools, if their essential teachers are to be retained. And this should be done promptly, since it will be difficult or impossible to get them back after they have once been classified. A ruling recently adopted in the War Department is to the effect that "men heretofore or hereafter classified in Class 1, Group A, and called to military service will not be granted furloughs." The class in which essential teachers of draft age should be placed is Class III-K, which is provided for technicians and experts in necessary industries. Since our medical schools are now practically military institutions in which soldiers on active duty in the U. S. Army are being trained to become efficient medical officers, it is important that the teaching faculties should be kept intact.

1. The Problem of Essential Teachers in Medical Schools, Current Comment, THE JOURNAL A. M. A., Oct. 26, 1918, p. 1412.

RESERVE OFFICERS FOR THE PUBLIC HEALTH SERVICE

Senate Joint Resolution No. 63, establishing a Reserve in the Public Health Service, has finally passed and been approved by the President. It authorizes the President to appoint and commission as officers in the Public Health Service Reserve citizens who, on examination, are found physically, mentally and morally qualified, the commissions to be in force for a period of five years. The officers commissioned shall be distributed in the same proportion as among the present commissioned Medical Corps of the Public Health Service among the several grades now obtaining in that service, namely, Assistant Surgeon-General, Senior Surgeon, Surgeon, Passed Assistant Surgeon, and Assistant Surgeon, which correspond respectively to the grades of Colonel, Lieutenant-Colonel, Major, Captain, and Lieutenant in the Army. Regulations for the organization and government of the Reserve Corps are now being prepared for submission to the President. In view of the manifold activities entrusted by law to the Public Health Service and the expansion of its functions by executive order of July 1, 1918, the new Reserve Corps will include in its membership a personnel with varied qualifications. In addition to physicians who will form the bulk of the reserve this will, therefore, comprise among others, sanitarians, sanitary engineers, chemists and bacteriologists. The passing of this law is another step toward adequate control of national health interests.

THE SEWAGE POLLUTION OF BOUNDARY WATERS

The International Joint Commission on Boundary Waters Between the United States and Canada has recently issued its final report.[1] The conclusions of the commission are based on the best expert knowledge and opinion now available, and will doubtless receive the consideration they deserve. The chief interest in the report centers in the limits of permissible pollution that are established. The commission recognizes that sewage disposal by dilution is a natural resource and that the utilization of this resource is justifiable for economic reasons, always assuming that an unreasonable burden or responsibility is not placed on the water purification plant, so as to occasion menace to the public health. It is believed by the commission that the safe loading of a water purification plant is exceeded if the annual average of *B. coli* in the water delivered to the plant is higher than about 500 per hundred c.c. As a working rule, it has been found that if, under conditions actually existing, the city sewage is diluted in the stream flow to 4 cubic feet per second per capita of the population, the resulting water will contain approximately 500 *B. coli* per cubic

1. Engin. News, Oct. 10, 1918, p. 660.

centimeter. Perhaps the essence of the report is found in the recommendation that all sewage should receive some purification treatment before being discharged into boundary waters, the degree of such treatment to be determined in large measure by the limit of safe loading of a water purification plant. The report marks a distinct progress in the practical adjustment of sewage disposal necessary to the public welfare.

Medical Mobilization and the War

Resolution to Provide a Reserve Corps for the Public Health Service

A joint resolution to provide a reserve corps for the United States Public Health Service was approved by the President on October 27. The resolution states:

Resolved, by the Senate and House of Representatives of the United States of America in Congress assembled, That for the purpose of securing a reserve for duty in the Public Health Service in time of national emergency there shall be organized, under the direction of the Secretary of the Treasury, under such rules and regulations as the President shall prescribe, a reserve of the Public Health Service. The President alone shall be authorized to appoint and commission as officers in the said reserve such citizens as, upon examination prescribed by the President, shall be found physically, mentally, and morally qualified to hold such commissions, and said commissions shall be in force for a period of five years, unless sooner terminated in the discretion of the President, but commission in said reserve shall not exempt the holder from military or naval service.

Provided, That the officers commissioned under this act, none of whom shall have rank above that of Assistant Surgeon-General, shall be distributed in the several grades in the same proportion as now obtains among the commissioned medical officers of the United States Public Health Service and shall at all times be subject to call to active duty by the Surgeon General, and when on such active duty shall receive the same pay and allowances as are now provided by law and regulation for the commissioned medical officers in the said regular commissioned Medical Corps.

Weekly Bulletin, American Expeditionary Forces

The following paragraphs are taken from Weekly Bulletin No. 26, Oct. 7, 1918, issued for circulation among American medical officers in France:

JUDGMENT AND INGENUITY DEMANDED IN TRANSFERRING PATIENTS BETWEEN HOSPITALS

(*a*) Do not transfer patients with pneumonia or respiratory tract infections; absolute rest is as vital to them while they are meeting and overcoming the infection as operation is for penetrating wounds of the abdomen. Patients with infectious diseases while still in the communicable stage should not be transferred.

(*b*) A good many patients with bone and joint injury are being evacuated from one hospital to another either inadequately splinted or entirely without splints. The excuse commonly given is that the standard splints are not available.

Such an excuse is, of course, entirely insufficient, since even though the standard splints are not available, the ingenuity of the surgeon should be used to devise some form of appliance that would be reasonably satisfactory for transport use until the regular splints can be used.

SERIOUS PRESENT SITUATION IN A. E. F.

During the past week there has been further extensive incidence of pneumonia, in almost all instances accompanying the prevailing epidemic of influenza. Large convoys brought to the base ports several thousand cases of severe influenza and many hundreds of cases of pneumonia. The death rate (case mortality percentage) among the pneumonia patients has risen to 32 per cent. for the A. E. F., and in some groups of cases it has been 80 per cent.

When unseasoned men have been sent to the A. E. F., the percentage attacked by influenza on shipboard and the percentage of complicating pneumonias developing among these contingents after arrival has been unusually high, 100 per cent. sick being reported from the Five Hundred and Thirty-Ninth Labor Battalion (Negro).

In addition to the three cardinal causes of high incidence of respiratory affections that still prevail widely (i. e., (1) overcrowding, (2) exposure to wet and cold, and (3) fatigue from overwork, long journeys, loss of sleep, or worry) there has been much pneumonia developing among men with influenza evacuated to base hospitals who should at all costs and by every means possible be kept where they are taken sick. Absolute rest, even though in the absence of skilled nursing, or under very primitive conditions of shelter, is indispensable to escape the complication of pneumonia.

Meningitis has made another sudden rise in incidence, as had been expected. Forty-eight of the seventy-one cases reported in the week were in the base sections, and thirty-three of the cases were found among troops on arrival of a convoy at one port.

Dysentery, diphtheria, measles, paratyphoid, scarlet fever and typhoid fever show a very satisfactory reduction during the week.

Provision for Essential Teachers in Medical Schools

The Committee on Education and Special Training of the War Department has issued the following circular letter relative to furloughs, induction and transfers for the information and guidance of institutions having a unit of the S. A. T. C.:

MEMORANDUM for Commanding Officers, Students' Army Training Corps, and Presidents of Students' Army Training Corps Institutions.
Subject: Policy as to Teachers Registered under Selective Service Act.

1. Men heretofore or hereafter classified in Class 1, Group A, and called to military service will not be granted furloughs.

2. Teachers who are essential are eligible to claim deferred classification under Section 80, Selective Service Regulations, and they are encouraged to do so. Such deferred classification should be claimed for them by the educational institution by which they are employed, in accordance with the paragraphs from Section 80, Selective Service Regulations.

3. Teachers who are denied deferred classification by the district board and who are liable to call to military service will be encouraged to request voluntary induction in the unit of the S. A. T. C. stationed at the institution where such instructors are employed.

4. In very exceptional cases and upon the recommendation of the Educational Department of the Committee teachers who have already been drafted and are now at mobilization camps will be transferred back as soldiers on active duty to the unit of S. A. T. C. where needed; provided such instructors do not object to return as soldier-instructors, have not been permanently assigned in a capacity wherein their services will be of great value to the Army, and have not already been designated to attend Officers' Training Schools.

5. Since the colleges are under contract with the War Department to train enlisted men in the U. S. Army, essential teachers are obviously engaged in occupations that are strictly "necessary to the maintenance of the Military Establishment." It is, therefore, expected that the really essential professors and teachers will be granted deferred classification under the law on this account. Heads of institutions should see to it that district boards and their industrial advisers are fully informed of all the facts in every case.

By direction of the Committee.

R. I. REES,
Colonel, General Staff Corps Chairman.

October 1, 1918.

COMMISSIONS OFFERED AND ORDERS TO DUTY ON ACCEPTANCE

Alabama

To Camp Beauregard, La., Lieuts. C. E. FORD, Roanoke; R. D. PORCH, Sylacauga.

To Camp McClellan, Ala., Lieut. J. W. GWIN, Bessemer.

To Camp Sheridan, Ala., Lieut. D. H. Chilton, Patton. Base hospital, for instruction, Lieut. W. B. HARDY, Birmingham.

To Camp Wheeler, Ga., Lieut. D. R. CORNELIUS, Pratt City.

To Fort Oglethorpe for instruction, Capts. W. M. WALDRUP, Bessemer; W. S. SOWELL, Empire; W. M. BOOTH, Hartselle; Lieuts. T. COLLINS, Birmingham; E. S. PRICE, Buhl; H. F. DOWNS, Clanton; G. H. SMITH, Ensley; W. D. MIXSON, Midland City.

To report to the commanding general, Southeastern Department, Capt. A. A. KIRK, Tuscaloosa; Lieut. E. T. BARKER, McFall.

Arizona

To Fort Oglethorpe for instruction, Capt. R. B. DURFEE, Bisbee.

To Fort Riley for instruction, Lieuts. T. R. WHITE, Kingman; H. W. RICE, Morenci.

To report to the commanding general, Southern Department, Capt. E. C. BAKER, Phoenix.

Arkansas

To Fort Oglethorpe for instruction, Capts. F. E. HARRISON, Fordyce; W. A. MOORE, Rogers.

To Fort Riley for instruction, Capts. O. E. JONES Newport; A. M. ELTON, Yellville; Lieuts. E. R. KING, Ben Lomond; V. V. BUTLER, Huntington; F. YOUNGBLOOD, Huntsville.

To Fort Sam Houston, Texas, Lieut. J. R. DALE, Jr., Texarkana.

California

To Camp Cody, N. M., base hospital, for instruction, Capt. E. J. COOK, Lieut. C. E. REYNOLDS, Los Angeles. *To examine the command* for nervous and mental diseases, Capt. T. J. BERGGREN, Coronado.

To Camp Kearney, Calif., base hospital, for instruction, Lieuts. C. N. MOONEY, Blue Lake; F. W. WATT, Sacramento; M. H. ARNOLD, San Diego; H. F. ADLER, San Francisco; H. E. TEBBETTS, Whittier.

To Denver, Colo., Lieut. J. W. NEVIUS, Los Angeles.

To Fort Oglethorpe for instruction, Capt. W. S. VAN DALSEM, San Jose.
To Fort Riley for instruction, Lieut. H. C. SMITH, Glendale.
To report to the commanding officer, Western Department, Capt. J. M. WARD, Oakland; Lieuts. E. G. BASHOR, Los Angeles; H. ABRONS, Napa.
To San Francisco, Calif., Letterman General Hospital, for instruction, Capt. W. A. RECKERS, Placerville; Lieut. J. S. MASON, Ventura.

Canal Zone

To Fort McPherson, Ga., Lieut. L. WENDER, Corozal.

Colorado

To Azalea, N. C., Capt. G. H. CATTERMOLE, Denver.
To Camp Dodge, Iowa, base hospital, for instruction, Lieut. I. C. MIERLEY, Denver.
To Camp Logan, Texas, Capt. D. C. GROVES, Olathe.
To Fort Oglethorpe for instruction, Capts. C. F. EAKINS, Brush; H. R. McGRAW, Denver.
To Fort Riley for instruction, Lieuts. L. W. SOLAND, Blanca; P. A. WATERS, Monte Vista.
To Whipple Barracks, Ariz., Capt. A. G. WALKER, Denver.

Connecticut

To Camp Joseph E. Johnston, Fla., Lieut. E. J. LYMAN, Hartford.
To Colonia, N. J., Lieut. R. C. PAINE, Thompson.
To Fort Oglethorpe for instruction, Lieut. J. J. TYNAN, Torrington.
To New Haven, Conn., Capt. H. W. FLECK, Bridgeport. Yale Army Laboratory School, for instruction, Lieut. C. T. BEACH, Hartford.
To New York, Neurological Institute, for instruction, Lieut. T. W. WORTHEN, Hartford.

District of Columbia

To Camp McClellan, Ala., base hospital, Lieut. C. B. CONKLIN, Washington.

Florida

To Camp Meade, Md., Lieut. B. H. SANCHEZ, Plant City.
To Fort Oglethorpe for instruction, Lieut. R. E. CHALKER, Live Oak.

Georgia

To Fort Oglethorpe for instruction, Lieuts. W. H. ALEXANDER, Blakely; H. H. BLAKE, Savannah.

Idaho

To Fort Riley for instruction, Capts. H. D. SPENCER, Idaho Falls; H. E. MELTON, Menan; Lieuts. H. J. SIMMONS, Blackfoot; A. A. NEWBERRY, Filer; G. T. PARKINSON, Rexburg.
To report to the commanding general, Western Department, Capts. E. H. FIELD, Jerome; C. P. STACKHOUSE, Sandpoint.

Illinois

To Camp Beauregard, La., base hospital, for instruction, Capt. S. G. WEST, Chicago.
To Camp Custer, Mich., Lieut. R. V. SPENCER, Chicago Heights.
To Camp Dodge, Iowa, base hospital, for instruction, Capt. F. J. LESEMAN, Chicago.
To Camp Grant, Ill., Capt. C. E. SCELETH, Chicago. Base hospital, for instruction, Lieuts. H. O. JONES, Chicago; R. O. HAWTHORNE, Monticello.
To Camp Pike, Ark., Lieuts. P. B. JOYCE, Chicago; J. P. O'NEILL, Highland Park. *To examine the command* for nervous and mental diseases, Capt. W. A. CROOKS, Peoria.
To Camp Sherman, Ohio, Lieut. E. W. MUELLER, Chicago.
To Camp Wheeler, Ga., base hospital, Lieut. E. A. STREICH, Chicago.
To Camp Zachary Taylor, Ky., Capt. B. F. FLANAGAN, Lieut. M. SOLOMON, Chicago. *To examine the command* for nervous and mental diseases, Lieut. A. H. WATERMAN, Chicago.
To Fort Des Moines, Iowa, Lieuts. R. B. KERSHAW, M. O'HEARN, Chicago.
To Fort Oglethorpe for instruction, Capts. S. W. SHURTZ, Champaign; F. H. BLAYNEY, R. C. CUPLER, F. P. MACHLER, A. W. McCLAVE, J. M. NICHOLSON, Chicago; G. STEELY, Danville; A. L. HAGLER, Springfield; Lieuts. F. C. BAECHT, Brussels; H. W. J. KOERPER, Buda; F. G. CARLS, E. S. CLEVELAND, C. H. CONNOR, W. S. CROWLEY, E. H. FLINN, A. W. GREGG, W. P. GUNN, H. C. HANSON, E. L. HESS, F. C. JACOBS, F. E. MILLER, J. H. MITCHELL, V. V. PISANI, H. C. RUNYAN, G. E. SANDSTEDT, F. M. SCHWARZEL, R. W. E. SPRENG, Chicago; B. L. VILNA, Cicero; C. O. BULGER, Greenfield; E. G. MERWIN, Highland; E. F. SCHEVE, Mascoutah; W. L. COTTINGHAM, Paxton; M. T. EASTON, Peoria; C. T. KELL, Salem; J. G. MEYER, Springfield; T. G. KNAPPENBERGER, St. Joseph; A. H. HUNTER, Staunton; A. J. FROELICH, West McHenry.
To Fort Riley for instruction, Capts. C. G. DAVIES, Blue Island; S. WAYLAND, Chicago; E. L. DAMRON, Effingham; L. H. TATE, Galesburg; T. E. McCALL, Vienna; Lieuts. A. TRIPODI, Benld; J. H. GAFF, O. B. FUNKHOUSER, A. MAGNUS, Chicago; G. HENDERSON, Clay City; C. M. COOK, J. L. FUNKHOUSER, Danville; F. E. HAGIE, Elizabeth; R. D. FINCH, Flora; M. L. HARTMAN, Garden Prairie; R. L. WATSON, Joliet; C. E. ERICSON, Quincy; C. H. BOSWELL, Rockford; W. E. COULTER, Seneca; J. E. MARVEL, Waynesville; S. W. BROWNSTEIN, Westville.
To report to the commanding general, Central Department, Capt. T. R. FOSTER, Watseka; Lieuts. C. P. GIERALTOWSKI, Chicago; H. C. McMILLIN, Morton.

Indiana

To Camp Custer, Mich., Capt. H. W. SIGMUND, Crawfordsville.
To Camp Greene, N. C., to examine the command for nervous and mental diseases, Capt. H. D. PURDUM, Sykesville.
To Camp Zachary Taylor, Ky., Lieut. R. M. FUNKHOUSER, Evansville.
To Colonia, N. J., Capts. J. A. CRAIG, Gary; G. D. KIMBALL, Marion.
To Fort Oglethorpe for instruction, Capts. J. B. STALKER, Borden; L. C. BICE, Edinburgh; G. S. BEATY, French Lick; J. J. BOAZ, W. B. KITCHEN, O. C. NEIER, Indianapolis; J. E. BIRD, New Albany; Lieuts. E. D. HAVENS, Cicero; T. D. PETERS, Flora; J. P. CHRISTIE, F. W. MAYER, H. F. NOLTING, Indianapolis; E. C. CEKUL, La Otto; E. BARNUM, Manilla; G. V. CRING, Portland; O. T. BRAZELTON, Princeton; F. E. BASS, Shelbyville; D. E. MURRAY, Sheldon.
To Fort Riley for instruction, Capts. R. S. CHAPPELL, W. F. KELLY, Indianapolis; Lieuts. H. S. HIATT, Albion; S. M. COMPTON, Forest; A. H. HENDRICKS, W. H. LONG, Indianapolis; W. I. SCOTT, Kokomo; P. T. GRANT, Marengo; F. T. TYLER, New Albany.
To New Haven, Conn., Yale Army Laboratory School, for instruction, Lieut. R. E. COLE, Muncie.
To report to the commanding general, Central Department, Capt. W. G. HUFFMAN, Richmond; Lieut. J. F. DRAKE, Youngstown.

Iowa

To Camp Dodge, Iowa, base hospital, for instruction, Capt. C. E. GLYNN, Davenport; Lieut. J. A. CAHILL, Volga City. *To examine the command* for nervous and mental diseases, Lieut. F. J. VAN METER, Clarinda.
To Camp Shelby, Miss., base hospital, for instruction, Lieut. F. A. GILLETT, Fremont.
To Camp Wheeler, Ga., base hospital, Capt. J. L. SEABLOOM, Red Oak.
To Fort Oglethorpe for instruction, Lieuts. J. H. WOLFE, Iowa City; W. G. ROWLEY, Sioux City.
To Fort Riley for instruction, Capts. W. C. PHILLIPS, Clarinda; S. D. CARNEY, Sioux City; Lieuts. J. D. PAUL, Anamosa; D. F. HUSTON, Columbus Junction; G. D. CLEAVER, Council Bluffs; T. D. JACOBS, Morley; N. W. LABAGH, Mystic; W. C. CUMMINGS, Ryan.
To report to the commanding general, Central Department, Capt. J. O. GANOE, Ogden; Lieut. E. B. HADLEY, Waterloo.

Kansas

To Camp Dodge, Iowa, base hospital, for instruction, Capt. W. A. KLINGBERG, Elmo.
To Camp Logan, Texas, Capt. J. B. CARTER, Wilson.
To Camp Pike, Ark., base hospital, Lieut. R. G. SMITH, Marion.
To Fort Oglethorpe for instruction, Capts. J. S. McBRIDE, Lyon; H. E. NELSON, Sharon Springs.
To Fort Riley for instruction, Lieuts. C. F. ATWOOD, Abilene; W. W. SCOTT, Athol; G. E. MARTIN, Callison; A. W. CORBETT, Emporia; M. L. BRAKEBILL, Florence; F. L. DEPEW, Howard; D. J. MOORE, Idana; P. L. JONES, Lenexa; J. W. DEMAND, Lincolnville; H. W. DAVIS, Little River; F. R. BLAKE, Marquette; O. M. CASSEL, Norton; W. O. POSTON, Quenemo; T. A. O'CONNOR, C. S. WOLFE, Topeka; E. S. HAWORTH, Viola; E. A. MYERS, Wakefield.

Kentucky

To Camp Sevier, S. C., Lieut. T. J. ROBB, North Fork.
To Fort Oglethorpe for instruction, Capts. H. C. WHITE, Covington; H. L. McLEAN, Wilmore; Lieuts. H. V. JOHNSON, Georgetown; A. BACH, Jackson; T. M. DORSEY, I. N. KERNS, Louisville; L. O. PINDAR, Tyronne; W. G. SHACKLETTE, Valley Station.
To New York, Neurological Institute, Capt. E. T. BRUCE, Louisville.
To report to the commanding general, Central Department, Capt. W. T. McKINNEY, S. P. MYER, Louisville.

Louisiana

To Camp Beauregard, La., base hospital, for instruction, Lieut. E. L. SANDERSON, Shreveport.
To Camp Bowie, Texas, base hospital, Lieut. W. M. JOHNSON, New Orleans.
To Camp Custer, Mich., Lieut. P. C. SCHMIDT, New Orleans.
To Camp Jackson, S. C., base hospital, for instruction, Capt. R. E. Stone, New Orleans.
To Camp Joseph E. Johnston, Fla., Lieut. L. CHATELAIN, Hessmer.
To Fort Oglethorpe for instruction, Capts. E. F. BACON, E. L. LECKERT, New Orleans; Lieuts. J. K. SHEPPARD, Houghton; E. BLOCH, H. E. MILLER, E. S. SCHARFF, New Orleans.

Maine

To Camp Jackson, S. C., base hospital, for instruction, Capt. D. B. CRAGIN, Waterville.
To Camp Upton, N. Y., Lieut. C. G. FARRELL, Gardiner.
To Mineola, N. Y., Capt. S. E. FISHER, Portland.
To Norfolk, Mass., Lieut. K. B. STURGIS, Fairfield.
To report to the governor of Maine, as Medical Aide, Capt. B. F. BRADBURY, Norway.

Maryland

To Camp Lee, Va., for instruction, Capt. P. L. TRAVERS, Easton.
To Camp Meade, Md., Lieut. A. STEIN, Baltimore.
To Camp Wadsworth, S. C., to examine the command for nervous and mental diseases, Lieut. W. S. CARSWELL, Ruxton.
To Fort Oglethorpe for instruction, Capt. J. S. WILLOCK, Roland Park; Lieuts. F. H. CLARK, W. O. WHITTLE, W. F. ZINN, Baltimore; W. A. GRACIE, Cumberland; B. I. JAMISON, Emmitsburg.

Massachusetts

To Arcadia, Fla., Carlstrom Field, Lieut. W. D. STACEY, Boston.
To Camp Devens, Mass., Lieut. W. E. HUNT, Bridgewater. Base hospital, Capts. G. H. STONE, Boston; O. M. DEEMS, Springfield; Lieut. W. W. HENNESSEY, Salem. Base hospital, for instruction, Capt. D. P. O'BRIEN, New Bedford; Lieuts. T. A. DEVAN, L. E. PHANEUF, Boston.
To Camp Jackson, S. C., base hospital, Lieut. C. H. LAWRENCE, Jr., Boston.
To Camp Lee, Va., Capt. H. M. CHASE, Boston. Base hospital, for instruction, Capts. H. H. GERMAIN, Boston; G. M. SHEAHAN, Quincy. For instruction, Lieut. C. A. ORDWAY, Everett.
To Camp Meade, Md., Lieuts. A. R. CUNNINGHAM, Boston; H. KAPLOVITCH, Haverhill.
To Camp Upton, N. Y., Lieut. M. F. McMAHON, Worcester.
To Colonia, N. J., Capt. J. E. OVERLANDER, Springfield.
To Fort Oglethorpe for instruction, Capts. A. H. RING, Arlington Heights; S. F. CURRAN, L. B. MORRISON, Boston; W. B. YOUNG, East Cambridge; F. D. McALLISTER, Lawrence; S. S. ORR, Weston; Lieuts. G. H. BINNEY, E. S. BISBEE, R. P. BONELL, W. E. CONNOLLY, J. G. HEGARTY, Z. A. MOLLICA, E. H. ROBBINS, J. L. SULLIVAN, Boston; J. D. TAYLOR, East Boston; W. H. SHER-

MAN, Graniteville; J. E. GRADY, Leominster; F. C. CASSIDY, Medford; C. SHANKS, New Bedford; G. A. WILKINS, Revere; E. A. GENEREAUX, Whitinsville; L. K. CROSS, Winchendon; J. P. CARROLL, Woburn; F. B. PUSKINIGIS, Worcester.

To Hoboken, N. J., Lieut. E. F. REGAN, Framingham.

To Lakewood, N. J., Lieut. T. E. BUCKMAN, Boston.

To Mineola, N. Y., Hazelhurst Field, for instruction, Capt. F. E. DOW, Northampton; Lieut. T. F. CAPELES, Haverhill.

To New Haven, Conn., Yale Army Laboratory School, for instruction, Capt. D. L. WILLIAMS, Boston; Lieuts. J. E. WATERS, Gardner; J. A. RUEL, Haverhill.

To report to the commanding officer, Northeastern Department, Capt. V. A. REED, Lawrence; Lieut. N. M. CROFTS, North Adams.

Michigan

To Camp Custer, Mich., Lieut. M. P. FISHER, Detroit. Base hospital, Capt. J. T. S. HAMILTON, Detroit; Lieut. P. VERMEULEN, Grand Rapids.

To Camp Zachary Taylor, Ky., base hospital, Lieut. C. S. KLOEPPEL, Detroit. Base hospital, for instruction, Lieut. E. I. CARR, Lansing.

To Colonia, N. J., Lieut. W. M. BURLING, Grand Rapids.

To Fort Oglethorpe for instruction, Capts. J. J. DELBRIDGE, Detroit; J. B. BROWN, Lavering; C. W. MERRITT, St. Joseph; Lieuts. W. S. CHAPIN, Ann Arbor; H. P. LAWRENCE, Bay City; A. L. HAIGHT, Crystal Falls; T. H. E. BEST, C. W. COURVILLE, R. S. MacKNIGHT, M. B. ROBINSON, Detroit; C. E. LONG, Grand Haven; V. L. OLER, Kearsarge; D. A. GALBRAITH, Lansing; G. F. LAMB, Pentwater; J. D. BRADFIELD, Portland; I. L. HUNT, Scottville; F. R. BURDENO, Sturgis.

To Fort Porter, N. Y., Lieut. F. C. BANDY, Newberry.

To report to the commanding general, Central Department, Capt. J. H. KIMBLE, Plymouth.

Minnesota

To Camp Custer, Mich., base hospital, for instruction, Lieut. T. L. CHAPMAN, Duluth.

To Camp Dodge, Iowa, base hospital, Capt. A. E. SMITH, Minneapolis.

To Camp Grant, Ill., base hospital, for instruction, Lieuts. F. F. MOREHOUSE, Owatonna; W. O. OTT, Rochester. For instruction, Capts. S. B. HAESSLY, Fairbault; I. SIVERTSEN, Minneapolis.

To Fort Oglethorpe for instruction, Capts. J. W. DOYLE, Minneapolis; W. W. HIGGS, Park Rapids; Lieuts. C. J. GOODHEART, Akeley; H. F. RAWLINGS, Eveleth; A. L. HAMEL, Minneapolis; G. A. MURRAY, Rochester.

To Fort Riley, Capt. T. THORDARSON, Minnesota. For instruction, Capt. W. P. LEE, Northfield; Lieuts. C. D. KOLSET, Benson; E. E. CRESS, Boyd; A. E. PHILLIPS, Delano; M. W. H. BECKMAN, H. LYSNE, C. L. RODGERS, Minneapolis.

Mississippi

To Camp Beauregard, La., Lieut. J. E. FURR, Belen.

To Fort Oglethorpe for instruction, Capts. J. S. JACKSON, Belzoni; J. E. WALLACE, Biloxi; Lieuts. R. E. GRAY, Bude; H. L. MAINS, Danvers; C. W. MITCHELL, Harkville; S. W. COLEY, Reid; W. D. COPELAND, Sandersville.

To report to the commanding officer, Southern Department, Capt. J. B. MOONEY, Scooba.

Missouri

To Camp Beauregard, La., Lieut. M. E. HAGERTY, St. Louis.

To Camp Dix, N. J., base hospital, Lieut. E. J. SCHISLER, St. Louis.

To Camp Dodge, Iowa, base hospital, Lieut. C. A. REVELLE, Kansas City.

To Camp Pike, Ark., Capt. W. R. SUMMERS, Springfield; Lieut. O. HOFMANN, Kansas City.

To Camp Shelby, Miss., base hospital, for instruction, Capt. E. L. DORSETT, St. Louis.

To Fort Oglethorpe for instruction, Capts. G. O. HAMMERSLEY, Campbell; E. P. PORTERFIELD, St. Louis; Lieuts. W. C. INGRAM, Browning; T. R. GAMMAGE, F. P. HERBST, Kansas City; P. L. PATRICK, Marceline; S. F. WEYGANDT, St. Louis.

To Fort Riley, Capt. H. L. REID, Charleston. For instruction, Capts. J. J. FARRELL, C. E. PAXON, Hannibal; J. S. SNIDER, Kansas City; F. L. McCORMICK, Moberly; T. A. ROSELLE, Palmyra; H. R. CLARK, Peirce City; W. C. PROUD, St. Joseph; S. T. BASSETT, C. N. GUHMAN, St. Louis; Lieuts. P. H. STOCKFLETH, Cameron; E. L. PARKER, Excelsior Springs; W. PIERCE, Forrest Park Heights; A. M. UNDERWOOD, Holstein; O. A. GROTE, Moberly; E. W. SULLIVAN, Osceola; C. D. OSBORNE, Otterville; H. H. FRANCIS, St. Joseph; J. DAVIE, P. A. ECK, A. A. WERNER, St. Louis; L. L. HENSON, West Eminence.

To report to the commanding officer, Central Department, Capt. M. B. AUSTIN, Brunswick; Lieut. W. H. ABER, Aullville.

Montana

To Fort Oglethorpe, Lieut. P. E. KANE, Butte. For instruction, Lieut. H. G. HARRIS, Poplar.

To Fort Riley for instruction, Lieut. W. B. SHORE, Red Lodge.

Nebraska

To Camp Dodge, Iowa, base hospital, for instruction, Lieut. O. H. HAHN, Hastings.

To Fort Oglethorpe for instruction, Lieuts. L. L. NELSON, Norfolk; L. A. DERMODY, Omaha; L. B. LAKE, Wausa.

To Fort Riley, Capt. W. R. McGREW, Omaha. For instruction, Capts. E. C. STEVENSON, Gothenburg; J. E. SIMPSON, Omaha; Lieuts. J. B. REDFIELD, North Platte; R. S. JOHNSTON, Omaha; J. R. LEIBEE, Polk; J. W. STOCKMAN, Red Cloud.

New Hampshire

To Colonia, N. J., Capt. G. H. PARKER, Hanover.

New Jersey

To Camp Dix, N. J., base hospital, Capt. W. S. BRANNER, Hoboken.

To Camp Meade, Md., Capt. O. B. DUNCAN, Paterson; Lieut. J. A. CONNELLY, Trenton.

To Fort Oglethorpe for instruction, Capts. H. ARBUCKLE, Boonton; J. V. BERGIN, Paterson; Lieuts. W. R. RIECK, Arlington; J. J. REASON, Garteret; E. W. MIERAU, Irvington; F. C. SHIPMAN, Jersey City; G. L. JOHNSON, Morristown; W. E. McCORMICK, Mount Vernon; J. J. SMITH, H. R. VAN NESS, Newark; W. E. WAKELEY, Orange; A. A. BUTTERFIELD, Passaic.

To Mineola, N. Y., Hazelhurst Field, for instruction, Capt. A. B. RUSSELL, East Orange.

To Plattsburg Barracks, N. Y., Lieut. M. A. CURRY, Greystone Park.

New Mexico

To Camp Cody, N. M., base hospital, Lieut. S. C. CLARKE, Albuquerque.

To Fort Riley for instruction, Lieuts. H. A. STROUP, Artesia; H. J. HOAG, Mora.

To report to the comanding general, Western Department, Lieut. E. S. FURAY, Lakewood, Southern Department, Lieut. C. W. GERBER, Las Cruces.

New York

To Boston, Mass., for intensive training, Lieut. F. W. SEWARD, Jr., Goshen.

To Camp Custer, Mich., base hospital, for instruction, Capt. J. HORNI, Brooklyn.

To Camp Devens, Mass., base hospital, for instruction, Lieuts. L. A. WYLIE, Harrison; J. W. GRAVES, Herkimer; R. S. COOPER, Syracuse.

To Camp Dix, N. J., base hospital, Capt. A. F. CHACE, New York.

To Camp Hancock, Ga., base hospital, Lieut. H. I. BERLOWE, New York. For instruction, Capt. S. B. THOMAS, Brooklyn.

To Camp Jackson, S. C., base hospital, for instruction, Capt. W. A. DOWNES, New York. For instruction, Major J. P. F. BURKE, Buffalo.

To Camp Joseph E. Johnston, Fla., Lieut. J. R. GLOBUS, Brooklyn.

To Camp Lee, Va., Lieut. F. E. DUBOIS, New York. Base hospital, for instruction, Capt. M. I. BLANK, New York; Lieut. C. W. SYMONDS, New York.

To Camp Logan, Texas, Lieut. L. MARCUS, Brooklyn.

To Camp McClellan, Ala., base hospital, Lieut. J. HEINE, New York.

To Camp Meade, Md., Lieuts. W. J. McGIBBON, Chatenuguy; W. ORMISTON, Delhi; G. A. GORISSE, S. L. HASELTINE, New York.

To Camp Sevier, S. C., base hospital, Lieut. W. Z. JEROME, New York.

To Camp Sheridan, Ala., base hospital, Lieut. F. H. COOK, Middletown.

To Camp Sherman, Ohio, Lieuts. L. W. BURDICK, Maryland; W. C. TREDER, Scotia.

To Colonia, N. J., Capt. A. BOOKMAN, New York.

To Fort McPherson, Ga., Capt. R. L. WOOD, Lieut J. ROSENTHAL, Brooklyn.

To Fort Oglethorpe, Lieut. S. WEIL, New York. For instruction, Capts. L. H. FINCH, Amsterdam; J. B. KOPF, Brooklyn; B. J. BIXBY, Buffalo; J. E. CANFIELD, Herkimer; F. A. DEAL, T. L. HEIN, J. R. HUNTER, New York; T. D. BUCK, Rochester; T. F. COLE, Romulus; Lieuts. R. J. KNAPP, Amsterdam; C. L. WAKEMAN, Andes; H. H. LESEUR, Batavia; H. M. KENYON, Binghamton; H. BERKOWITZ, M. CANICK, M. GITTELSON, D. R. GROTEMTEIN, L. MAMELOK, Brooklyn; O. S. McKEE, A. L. WEIL, Buffalo; R. BRITTAIN, Downsville; S. T. HAMILTON, Elmira; G. C. ANDERSON, J. ARENA, F. E. BINGHAM, B. S. BRAKE, J. M. DOHERTY, P. J. FAGAN, I. HARTSHORNE, D. KATZ, M. J. LIPPMAN, J. M. LOBSENZ, M. T. MAXWELL, L. M. PEARLMAN, J. ROHR, S. SALADINO, D. SCHULMAN, New York; N. W. GETMAN, Oneonta; F. H. GODDARD, A. C. SCINTA, E. J. WENDEL, Rochester; A. T. LAWLESS, Syracuse; H. P. PECKHAM, Waterford.

To Hoboken, N. J., Capts. C. J. CARR, Buffalo; E. A. FRENCH, Rochester; Lieuts. R. ROBINSON, Lackawanna; M. M. ANDREWS, New York.

To Lakewood, N. J., Lieut. H. A. COHEN, New York.

To Mineola, N. Y., Hazelhurst Field, for instruction, Capt. F. H. LASHER, Brooklyn.

To New Haven, Conn., Yale Army Laboratory School, for instruction, Lieut. S. GITLOW, New York.

To Newport News, Va., Lieuts. L. E. KLINGON, J. MAYEROFF, New York.

To report to the commanding general, Eastern Department, Major E. W. PETERSON, New York.

To Rockefeller Institute for instruction in the treatment of infected wounds, Lieut. F. W. BISHOP, New York.

To Williamsbridge, N. Y., Capt. G. W. TONG, Brooklyn.

North Carolina

To Fort Oglethorpe for instruction, Lieuts. R. E. RHYNE, Gastonia; B. L. LONG, Glen Alpine; J. E. HOBGOOG, Thomasville.

To New Haven, Conn., Lieut. J. E. COCKE, Asheville.

North Dakota

To Camp Logan, Texas, base hospital, Lieut. F. A. BRUCHMAN, Minot.

To Colonia, N. J., Capt. W. H. BODENSTAB, Bismarck.

To Fort Oglethorpe for instruction, Lieut. H. A. BRANDES, Hebron.

To Fort Riley for instruction, Lieuts. C. A. PLATOU, Jr., Litchville; E. E. HAMILTON, New Leipsig; C. A. KERNER, Tuttle.

Ohio

To Camp Greene, N. C., base hospital, for instruction, Capt. H. L. BABCOCK, Waterville

To Camp Meade, Md., Lieut. T. G. McCORMICK, Portsmouth.

To Camp Sevier, S. C., Lieut. J. R. SPRAGUE, Athens.

To Camp Shelby, Miss., for instruction, Capt. R. B. DRURY, Columbus.

To Camp Sherman, Ohio, base hospital, for instruction, Lieut. J. T. LAWLESS, Jr., Toledo.

To Camp Wadsworth, S. C., base hospital, for instruction, Capt. J. McCLAIN, Coshockton.

To Camp Wheeler, Ga., base hospital, Lieut. E. B. MARKEY, Dayton.

To Camp Zachary Taylor, Ky., Lieut. C. N. WATKINS, Chattanooga.

To Fort Oglethorpe for instruction, Capts. C. E. TOWNSEND, Akron; R. E. HUGHSON, Bluffton; T. H. SHORR, Canton; D. S. HEYN, S. H. SMITH, Cincinnati; J. NEUBERGER, Cleveland; C.

WATSON, Findlay; B. L. JOHNSON, Kenton; J. B. McCORD, Oberlin; W. E. GAULT, Portsmouth; Lieuts. R. VAUGHEN, Cedar Mills; L. M. OTIS, Celina; J. A. DUFFEY, W. C. HERMAN, R. W. KASTING, R. W. SIMMONS, Cincinnati; D. J. BRYANT, W. H. HYDE, K. E. OCHS, I. S. OLSEN, Cleveland; E. L. HARNEY, A. B. LANDRUM, T. R. WILLIAMS, Columbus; H. N. CRANDALL, Conneaut; F. W. WATKINS, Defiance; E. D. HELFRICE, Galion; A. COBURN, Homer; F. F. FIELD, Meeker; H. I. BLOOD, Middletown; F. P. ATKINSON, Millersport; G. H. GALE, Newport; J. F. BLACK, Painesville; W. H. LEE, Plain City; G. C. McCREIGHT, Willard; R. W. RIGGS, Youngstown; D. J. MATTHEWS, G. W. McCORMICK, Zanesville.

To New Haven, Conn., Yale Army Laboratory School, for instruction, Lieuts. P. H. DORGER, Cincinnati; C. E. LITTLE, Logan.

To report to the commanding general, Central Department, Lieuts. F. M. HARRISON, Napoleon; G. B. KISTLER, Newcomerstown; E. J. KEHRES, Warrensville.

Oklahoma

To Camp Beauregard, La., Lieut. H. M. EVANS, Rush Springs.

To Camp MacArthur, Texas, base hospital, Lieut. E. A. ABERNETHY, Altus.

To Camp Travis, Texas, Lieuts. J. B. HAMPTON, Commerce; A. M. COOTER, Miami.

To Fort Oglethorpe for instruction, Lieut. J. C. WILLIAMS, Picher.

To Fort Riley for instruction, Capt. T. A. RHODES, Cherokee; Lieuts. F. P. ROBINSON, Agra; J. C. LUSTER, Davis; H. H. BISHOP, Dilworth; H. K. MILLER, Fairland; E. F. MILLIGAN, Geary; F. A. MILLER, Hartshorne; C. J. BARKER, Kaw; J. C. MATHENEY, Lindsay; A. R. MAVITY, Marlow; A. C. HIRSHFIELD Oklahoma City; F. H. NORWOOD, Prague.

Oregon

To report to the commanding officer, Western Department, Lieut. J. J. ROSENBERG, Portland.

Pennsylvania

To Camp Crane, Pa., Lieut. A. W. HOPPER, Bridgeville.

To Camp Dix, N. J., Lieuts. F. P. STONE, Philadelphia; A. J. MAYSELS, South Bethlehem.

To Camp Greene, N. C., base hospital, for instruction, Capt. C. BECKER, Philadelphia.

To Camp Jackson, S. C., base hospital, for instruction, Capt. F. S. MORRIS, Pittsburgh.

To Camp Lee, Va., Lieut. G. I. WINSTON, Reading. Base hospital, for instruction, Capt. C. I. WENDT, Pittsburgh.

To Camp Wheeler, Ga., base hospital, Lieut. J. C. RICKETTS, Pittsburgh.

To Colonia, N. J., Lieut. J. S. DIVEN, Philadelphia.

To Fort McPherson, Ga., Lieut. F. W. PATON, Bradford.

To Fort Oglethorpe for instruction, Capts. L. S. WALTON, Altoona; E. F. ARBLE, Carrolltown; C. E. IMBRIE, Cochranton; J. D. CALDWELL, Irwin; H. M. STEWART, Johnstown; H. M. FELTON, Pittsburgh; E. A. SWEENEY, Wilkes-Barre; Lieuts. J. R. BARTLETT, Bellefonte; G. G. ASH, Bradford; C. L. HARSHA, Canonsburg; V. J. MULVEHILL, Carrolltown; E. T. WILLIAMS, Danville; C. E. ALLISON, Elysburg; C. H. ASHTON, Franklin; J. G. STEELE, Galeton; O. C. REICHE, Hazelton; G. R. LYON, Heilwood; C. C. CUSTER, Johnstown; J. AARONOFF, Kemblesville; J. W. ALLEN, Monongahela; A. H. McANULTY, Nanty-Glo; A. M. ADAMS, E. C. COLLINS, W. V. MARSHALL, S. MOSS, C. S. PANCOAST, J. G. SILVERMAN, H. A. STEES, Philadelphia; F. B. EDMUNDSON, W. N. GOEHRING, J. GORFINKELL, P. J. HENNEY, W. H. THOMPSON, Pittsburgh; H. R. REED, L. G. SWEENEY, Scranton; L. M. HOLT, Shamokin; J. R. STEIN, Shenandoah; B. L. TINKER, West Middlesex; D. A. ATKINSON, West View; E. A. COSTELLO, Wilkes-Barre; J. C. FRYE, Williamsburg.

To Mineola, L. I., Hazelhurst Field, for instruction, Capts. M. B. FRANKLIN, J. K. KNORR, Jr., Philadelphia.

To New Haven, Conn., Lieuts. J. P. FRANTZ, Clearfield; A. EPSTEIN, Philadelphia. To Yale Army Laboratory School for instruction, Capt. A. B. WALLGREN, Pittsburgh; Lieut. D. A. GOODMAN, Old Forge.

To Newport News, Va., Capt. E. S. BRIGGS, Tidioute.

To report to the commanding officer, Eastern Department, Capts. E. H. GREEN, Mill Creek; W. H CARPENTER, Philadelphia.

Rhode Island

To Camp Dix, N. J., base hospital, for instruction, Lieut. E. M. PORTER, Providence.

To report to the commanding officer, Northeastern Department, Capt. R. H. R. SHAW, Providence.

South Carolina

To Camp Meade, Md., base hospital, for instruction, Capt. G. T. TYLER, Jr., Greenville.

To Fort Oglethorpe for instruction, Capt. W. M. GAILLARD, Georgetown; Lieut. J. W. TARRANT, Lynchburg.

South Dakota

To Fort Riley for instruction, Capts. J. F. D. COOK, Langford; R. P. FRINK, Wagner; Lieuts. I. U. VANGSNESS, Beresford, T. ARNOLD, Delmont; J. H. DOUPE, A. P. HAWKINS, Waubay.

To New Haven, Conn., Yale Army Laboratory School, Lieut. L. HOLTZ, Aberdeen.

Tennessee

To Camp Joseph E. Johnston, Fla., Lieut. H. L. ELLISON, Millington.

To Fort Oglethorpe for instruction, Lieuts. T. H. ELLIOTT, Chattanooga; C. W. RAIN, Knoxville; L. L. RICKS, Laconia; C. A. ALLEN, Memphis; E. W. PATTON, North Chattanooga; S. T. WOODRUFF, Pleasant View; G. W. SMITHERS, Rutledge; O. H. WILLIAMS, Savannah.

Texas

To Camp MacArthur, Texas, base hospital, for instruction, Lieut. J. B. NESTOR, Itasca.

To Fort Oglethorpe for instruction, Lieuts. C. W. WELLER, Austin; D. B. BEACH, Dodsonville; J. E. WILSON, Lancaster; J. T. HUTCHINSON, Lu Block.

To Fort Riley for instruction, Lieuts. C. M. PAYNE, Benford; C. D. SCAFF, Clarkesville; A. T. HAMPTON, Ferris; A. J. SHARP, Franklin; J. G. WHIGHAM, Walburg; C. P. JOHNSON, Whiteright.

To report to the commanding officer, Southern Department, Lieuts. T. H. WESTBROOK, Fort Worth; L. C. ROBERTS, Malone.

Utah

To Fort Riley for instruction, Capts. H. B. FORBES, Ogden; H. M. VANCE, Pleasant Grove; Lieut. S. J. ULMAN, Salt Lake City.

Vermont

To Fort Oglethorpe for instruction, Lieut. H. L. PIERCE, Swanton.

Virginia

To Camp Custer, Mich., Lieut. S. H. YOKELEY, Meadow View.

To Camp Greene, N. C., Lieut. A. S. BRINKLEY, Richmond. Base hospital, Lieut. F. H. SMITH, Abingdon. Base hospital, for instruction, Capt. R. S. FITZGERALD, Richmond.

To Fort Oglethorpe for instruction, Capts. E. J. NIXON, Petersburg; C. M. EDWARDS, Richmond; Lieuts. W. L. GANNAWAY, Abingdon; T. D. MOREWITZ, Newport News; J. H. MOORE, Pardee; J. E. SMITH, Petersburg; W. H. CRAIG, Richmond; B. E. TOPHAM, Roanoke; D. T. GOCHENOUR, Stuarts' Draft.

To Newport News, Va., Lieut. J. D. COLLINS, Portsmouth.

West Virginia

To Camp Wheeler, Ga., Lieut. N. P. YEARDLEY, Parkersburg.

To Fort Oglethorpe for instruction, Capt. D. M. RYAN, Talcott; Lieuts. H. O. VAN TROMP, French Creek; W. L. LINDER, Minden; R. W. WERNER, Parkersburg; I. C. W. FLING, Pullman; C. H. CLOVIS, Wheeling.

Washington

To Camp Kearney, Calif., Lieut. E. L. SMYTHE, Bremerton.

To Camp Lewis, Wash., base hospital, Capt. F. W. HILSCHER, Spokane. Base hospital, for instruction, Capts. O. L. ADAMS, Davenport; P. C. IRWIN, Seattle.

To report to the commanding officer, Western Department, Capts. B. D. HENRY, Endicott; S. B. HOPKINS, Spokane; Lieuts. C. A. RIEMCKE, North Yakima; R. HANSON, W. T. SCHWABLAND, Spokane.

Wisconsin

To Camp Custer, Mich., Lieut. E. R. DEBOTH, Green Bay. Base hospital, for instruction, Lieut. I. E. LEVITAS, Green Bay. *To examine the command* for nervous and mental diseases, Capt. W. T. KRADWELL, Wautosa.

To Camp Grant, Ill., for instruction, Capt. F. A. FORSBECK, Milwaukee.

To Fort Oglethorpe for instruction, Lieuts. H. P. BOWEN, Johnson Creek; R. E. FITZGERALD, M. L. NAHIN, Milwaukee; E. S. RYAN, Sheboygan.

To Fort Riley for instruction, Lieuts. J. M. KELLEY, Cato; E. CHARBONNEAU, W. E. HATCH, Superior.

Wyoming

To Camp Dodge, Iowa, base hospital, for instruction, Capt. L. P. DESMOND, Cheyenne.

To Fort Oglethorpe for instruction, Lieut. L. W. STOREY, Douglas.

To Fort Riley for instruction, Capt. J. P. MARKLEY, Laramie; Lieuts. T. B. TORJUSON, Lovell; D. C. ROSS, Upton.

ORDERS TO OFFICERS OF THE MEDICAL CORPS, U. S. ARMY

Alabama

Honorably discharged on account of physical disability existing prior to entrance into the service, Lieut. J. M. BELL, Eufaula.

Arizona

To Camp Crane, Pa., from Plattsburg Barracks, Capt. L. P. KAULL, Jerome. Evacuation Ambulance Company, from Fort Riley, Lieut. E. J. GOTTHELF, Jr., Tucson.

Arkansas

To Camp Shelby, Miss., from Camp Beauregard, Lieut. J. R. SMITH, Lewisville.

To Fort Riley for instruction, Lieut. C. WALLIS, Arkadelphia.

To report to the commanding general, Southern Department, from Camp Jackson, Major W. E. McLAIN, Argenta.

Honorably discharged on account of physical disability existing prior to entrance into the service, Lieut. J. C. HUGHES, Walnut Ridge.

California

To Camp Crane, Pa., Evacuation Ambulance Company, from Fort Riley, Capts. J. H. TITUS, Ontario; H. P. WILSON, Whittier; Lieut. W. L. YAGER, Ludlow.

To Leland Stanford University, Calif., to give orthopedic instruction, Capt. L. W. ELY, San Francisco.

To Washington, D. C., from San Francisco, Capt. S. L. HAAS, San Francisco.

Canal Zone

To Rockefeller Institute for instruction in the treatment of infected wounds, and on completion *to Lakewood, N. J.*, for instruction, from Fort Oglethorpe, Lieut. N. B. KUPFER, Ancon.

Colorado

To Camp Crane, Pa., Evacuation Ambulance Company, from Fort Riley, Capt. J. ATCHESON, Jr., Idaho Springs.

To Camp Dix, N. J., base hospital, from Camp Crane, Capt. E. G. GRIFFIN, Denver.

To Camp Jackson, S. C., base hospital, for instruction, from Washington, Major C. A. POWERS, Denver.

To Rockefeller Institute for instruction in the treatment of infected wounds, and on completion *to Camp Devens, Mass.*, base hospital, for instruction, from Fort Oglethorpe, Capt. C. J. LATTA, Haxtum.

Connecticut

To Camp Greene, Charlotte, N. C., base hospital, from Fort Oglethorpe, Lieut. E. S. COGSWELL, Hartford.
To Camp MacArthur, Texas, base hospital, from Camp Logan, Lieut. R. F. SCHOLL, New Haven.
To Colonia, N. J., and on completion *to Boston, Mass.*, Harvard Graduate School of Medicine, for instruction, from Fort Oglethorpe, Major L. W. BACON, New Haven.
To Hoboken, N. J., from Camp Sevier, Lieut. C. F. VERNLUND, Hartford.
To Norfolk, Mass., from Camp Devens, Lieut. M. J. SHEALEY, Derby.
Honorably discharged on account of physical disability existing prior to entrance into the service, Lieut. H. F. MOORE, Bethel.
The following order has been revoked: *To Hot Springs, N. C.*, for instruction, Lieut. L. G. BEARDSLEY, Bridgeport.

District of Columbia

To Camp Crane, Pa., from Camp Meade, Capt. H. F. W. WARDEN, Washington.
To Fort Des Moines, Iowa, from Fort Omaha, Capt. O. C. COX, Washington.
To Fort Oglethorpe for instruction, Lieut. C. E. YOUNG, Washington.

Florida

To Camp Lee, Pa., from Mays Landing, N. J., Major G. R. PLUMMER, Key West.
To Fort Oglethorpe, evacuation hospital, from Camp Joseph E. Johnston, Major G. E. HENSON, Jacksonville.

Georgia

To Camp Crane, Pa., from Walter Reed General Hospital, Capt. C. BARROW, Savannah. Base hospital, from Camp Custer, Capt. W. J. MATHEWS, Quitman.
To Camp Meade, Md., evacuation hospital, from Fort Oglethorpe, Capt. J. A. WHITE, Albany.
To Fort Oglethorpe for instruction, Lieuts. J. G. DEVANE, Adel; J. B. CARTER, Blundale.
Honorably discharged on account of physical disability existing prior to entrance into the service, Lieut. W. H. CLARK, La Grange.
Resignation of Major A. H. LINDORNE, Atlanta, accepted.
The following order has been revoked: *To Hampton, Va.*, Langley Field, Lieut. J. P. KENNEDY, Atlanta.

Illinois

To Camp Crane, Pa., base hospital, from Fort Oglethorpe, Lieuts. C. R. BENNER, C. J. CHALLENGER, Chicago; J. C. KASSMEYER, Durand; L. F. BOWMAN, Mount Carroll. Evacuation hospital, from Camp Zachary Taylor, Lieut. T. W. HAGERTY, Chicago.
To Camp Grant, Ill., from Fort Oglethorpe, Lieut. E. L. DALLWIG, Chicago.
To Camp Upton, N. Y., base hospital, from Camp Lee, Capt. H. B. THOMAS, Chicago.
To Camp Wheeler, Ga., from Fort Oglethorpe, Capt. C. H. SOLOMON, Chicago.
To Fort Oglethorpe, evacuation hospital, from Fort Riley, Lieut. F. C. FINK, Pleasant Plains.
To Hoboken, N. J., from Camp Beauregard, Lieut. W. C. COOK, Peoria; from Camp Lee, Lieut. E. C. PRATT, Kankakee. Base hospital, from Camp Dodge, Lieut. E. A. CORCORAN, Chicago.
To Washington, D. C., St. Elizabeth's Hospital, from Fort Sam Houston, Capt. C. A. BRINK, Apple River.
To Willoughby, Ohio, from Fort Oglethorpe, J. W. KAIL, Chicago.
Honorably discharged on account of physical disability incurred in line of duty, Capt. F. M. EDWARDS, Centralia. On account of physical disability existing prior to entrance into the service, Capt. C. C. CLARK, Lieut. A. I. EPSTEIN, Chicago.
The following order has been revoked: *To Fort Oglethorpe* for instruction, Capt. W. G. WHITE, Jonesboro.

Indiana

To Camp Colt, Pa., from Camp Grant, Capt. C. L. ROWLAND, West Point.
To Fort Moultrie, S. C., from Camp Wadsworth, Lieut L. O. SHOLTY, Wabash.
To Fort Oglethorpe for instruction, Lieut. R. B. T. SWEANY, Rockville.
To Mineola, N. Y., Hazelhurst Field, for instruction, from Vancouver Barracks, Lieut. C. C. ROZELLE, La Grange.
To Walter Reed General Hospital, D. C., from Fort Oglethorpe, Capt. A. W. LLOYD, Hammond.
Honorably discharged on account of physical disability existing prior to entrance into the service, Lieuts. D. HART, Montgomery; W. B. ASHBY, Oakland City.

Iowa

To Camp Colt, Pa., from Camp Grant, Lieut. C. A. MILLER, Nevinville.
To Camp Crane, Pa., base hospital, from Fort Oglethorpe, Capt. H. M. DECKER, Davenport. Evacuation Ambulance Company, from Fort Riley, Capts. S. A. HUBER, Charter Oak; H. D. MERENESS, Dolliver; Lieut. J. O. WEAVER, Shenandoah.
To Hoboken, N. J., base hospital, Capt. A. D. McKINLEY, Lieut. H. E. RANSOM, Des Moines.

Kansas

Honorably discharged on account of physical disability existing prior to entrance into the service, Capt. W. A. NIXON, Great Bend.

Kentucky

To Camp Crane, Pa., base hospital, from Fort Oglethorpe, Lieut. I. H. BROWNE, Winchester.
To Camp Sevier, S. C., from Fort McPherson, Capt. E. L. BUSBY, Lexington.
Honorably discharged on account of physical disability existing prior to entrance into the service, Capt. J. L. STILLINGS, Green Mount.

Louisiana

To Hoboken, N. J., from Camp Hancock, Capt. W. P. PORKIN, New Orleans.

Maine

To Hoboken, N. J., from Camp Devens, Lieut. F. E. ROWE, Augusta.
To Princeton, N. H., Princeton University, from Mineola, Capt. W. E. WHITNEY, Bangor.
Honorably discharged on account of physical disability existing prior to entrance into the service, Lieut. W. J. LEWIS, Freeport.
The following order has been revoked: *To Camp Crane, Pa.*, base hospital, from Camp Dix, Capt. D. W. WENTWORTH, Sanford.

Maryland

To Fort McPherson, Ga., from Camp Sevier, Capt. I. J. SPEAR, Baltimore.
To Hoboken, N. J., from Camp Meade, Capt. A. C. GILLIS, Baltimore.
To New York, Neurological Institute, for instruction, from Fort Oglethorpe, Capt. J. O. PURVIS, Annapolis.
To Rockefeller Institute for instruction in the treatment of infected wounds, and on completion *to Camp Lee, Va.*, base hospital, for instruction, from Fort Oglethorpe, Lieut. S. M. PILCHARD, Salisbury.
Honorably discharged, Lieut. J. TURNER, Baltimore.

Massachusetts

To Camp Abraham Eustis, Va., for duty, from Camp Devens, Capt. J. W. BOYD, Springfield.
To Camp Crane, Pa., mobile hospital, from Camp Morrison, Capt. W. E. HUNT, Malden.
To Fort McPherson, Ga., from Fort Oglethorpe, Capt. G. M. MASON, Boston.
To Mays Landing, N. J., from Northeastern Department, Lieut. V. S. MERRITT, Springfield.
To New Castle, Del., from Camp Dix, Capt. W. Y. FOX, Taunton.
To Newport News, Va., from Fort Oglethorpe, Lieut. F. S. LACZYNSKI, Holyoke.
To Norfolk, Mass., from Camp Devens, Lieut. H. R. FIEGE, Cambridge.
The following orders have been revoked: *To Camp Crane, Pa.*, from Walter Reed General Hospital, Lieut.-Col. F. B. LUND, Boston. *To Fort Hamilton, N. Y.*, from Camp Colt, Lieut. E. S. LEWIS, Princeton.

Michigan

To Camp Bowie, Texas, as orthopedic surgeon, from Fort Oglethorpe, Lieut. A. W. NEWITT, Detroit.
To New York, Neurological Institute, for instruction, from Fort Oglethorpe, Lieut. H. W. WILEY, South Haven.
The following order has been revoked: *To Fort Oglethorpe* for instruction, from Camp Logan, Capt. N. J. PIKE, Saginaw.

Minnesota

To Camp Beauregard, La., base hospital, from Lake Charles, La., Lieut. A. D. CORNIEA, St. Paul.
To Hoboken, N. J., base hospital, Capts. M. M. GHENT, M. C. WELCH, St. Paul.

Mississippi

The following order has been revoked: *To Camp Crane, Pa.*, base hospital, from Fort Oglethorpe, Capt. J. CRISLER, Jackson.

Missouri

To Camp A. A. Humphreys, Va., from Camp Grant, Lieut. C. T. EBER, St. Louis.
To Camp Crane, Pa., Evacuation Ambulance Company, from Fort Riley, Lieuts. F. P. RILEY, Clyde; J. C. CALDWELL, La Clede; D. C. PERRY, Mound City; D. A. SEIBERT, Washington.
To Camp Sevier, S. C., base hospital, Capt. J. S. LICHTENBERG, Kansas City.
To Fort Des Moines, Iowa, from Fort Oglethorpe, Capt. T. G. ORR, Kansas City.
To Hoboken, N. J., from Camp Upton, Capt. W. G. JONES, Lincoln. Base hospital, from Fort Sheridan, Major J. C. MORFIT, St. Louis.
To Rockefeller Institute for instruction in the treatment of infected wounds, and on completion *to Camp Dix, N. J.*, base hospital, for instruction, from Fort Oglethorpe, Capt. C. H. VAN RAVENSWAAY, Boonville.
Honorably discharged on account of physical disability existing prior to entrance into the service, Lieuts. F. A. HUDSON, Buffalo; T. E. CHAPMAN, Joplin.
Resignation of Capt. V. B. JANES, Cameron, accepted.

Montana

To Hoboken, N. J., from Camp Wadsworth, Lieut. A. C. KNIGHT, Butte.

Nebraska

To Camp Crane, Pa., Evacuation Ambulance Company, from Fort Riley, Capts. B. M. DEARDORF, Clatonia; E. I. WHITEHEAD, Holdrege.
To Hoboken, N. J., from New Haven, Lieut. C. M. HYLAND, Omaha.
To Mineola, N. Y., Hazelhurst Field, for instruction, from Vancouver Barracks, Capt. O. A. BRITTELL, Belgrade.

New Hampshire

To Fort Oglethorpe, base hospital, from Fort Sill, Major N. E. GUILLET, Manchester.

New Jersey

To Camp Crane, Pa., from Fort McHenry, Capt. J. L. FEWSMITH, Newark.
To Camp Lee, Va., base hospital, for instruction, Lieut. M. KUMMEL, Harrison.
To Lawrenceville, N. J., Milbank Farms, from Camp Devens, Lieut. C. BROWNE, Princeton.
Resignation of Capt. W. H. SLOCUM, Long Branch, accepted.
The following order has ben revoked: *To Camp Crane, Pa.*, base hospital, from Camp Lee, Lieut. J. L. FARDEN, Irvington.

New York

To Camp Beauregard, La., to examine the command for nervous and mental diseases, from Fort Oglethorpe, Lieut. J. RESNIK, New York.
To Camp Crane, Pa., from Camp Sheridan, Lieut. S. S. FRIEDMAN, New York; from Fort Oglethorpe, Capt. J. J. SINNOTT, Mount Ver-

non. Base hospital, from Fort Oglethorpe, Capt. C. W. PERKINS, New York; from New York, Capt. E. C. KOENIG, Buffalo.

To Camp Dix, N. J., base hospital, for instruction, Lieut. J. M. SCHAFFER, New York.

To Camp Kendrick, N. J., from Fort Oglethorpe, Capt. J. S. PARKER, White Plains.

To Camp Meade, Md., from the Surgeon-General's Office, Lieut. F. N. POTTS, Buffalo.

To Camp Upton, N. Y., from Walter Reed General Hospital, Lieut. R. G. FOWLER, Buffalo.

To Camp Wheeler, Ga., from Fort Oglethorpe, Capt. L. B. MOUNT, Albany.

To Colonia, N. J., from Fort Oglethorpe, Capt. E. ALTMAN, New York.

To Fort Oglethorpe for instruction, from Baltimore, Lieut. L. H. WHEELER, Lockport.

To Hoboken, N. J., from Camp Dix, Lieut. R. W. MOODY, Middletown; from Camp Sherman, Lieut. G. R. STALTER, Troy.

To Mineola, N. Y., Hazelhurst Field, for instruction, from Vancouver Barracks, Lieut. G. BERGER, Port Chester.

To New Haven, Conn., Yale Army Laboratory School, for instruction, Lieut. R. E. PERSONS, East Durham.

To Newport News, Va., from Fort Oglethorpe, Lieut. W. MOEHLE, Brooklyn.

To Walter Reed General Hospital, D. C., from Camp Devens, Lieut. S. DANZER, Brooklyn.

Honorably discharged on account of physical disability existing prior to entrance into the service, Capt. G. T. WILSON, Hoosick Falls.

North Carolina

To Camp Lee, Pa., from New Castle, Lieut. R. T. UHLS, Franklinton.

North Dakota

To Camp Crane, Pa., from Camp Grant, Lieut. W. H. WITHERSTINE, Grand Fork. Evacuation Ambulance Company, from Fort Riley, Lieut. H. VAN DE ERVE, Sherwood.

Ohio

To Camp Beauregard La., from Fort Oglethorpe, Capt. J. A. LYTLE, Cleve; Lieut. E. HUFFER, Milford Center.

To Camp Custer, Mich., from Camp Grant, Lieut. R. A. DALBEY, Youngstown.

To Camp Grant, Ill., from Fort Oglethorpe, Lieut. A. E. MILLS, New Boston.

To Camp Greene, N. C., base hospital, from Fort Oglethorpe, Lieut. J. H. VORHES, Columbus.

To Denver, Colo., from Fort Riley, Capt. E. A. BAKER, Clyde.

To Fort Monroe, Va., from Camp Dix, Capt. C. D. HOY, Columbus.

To Mineola, N. Y., Hazelhurst Field, for instruction, from Vancouver Barracks, Lieut. V. T. SCOTT, Clarksburg.

To New Haven, Conn., Yale Army Laboratory School, for instruction, from Fort McPherson, Lieut. P. A. MURR, Galion.

To report to the governor of the Panama Canal, Lieut. L. W. GORTON, Cincinnati.

To Rockefeller Institute for instruction in the treatment of infected wounds, and on completion *to Camp Dix, N. J.*, base hospital, for instruction, from Fort Oglethorpe, Lieut. G. F. BARNETT, Painesville.

Honorably discharged on account of physical disability existing prior to entrance into the service, Lieut. A. F. SNELL, Jr., Cincinnati.

The following order has been revoked: *To Fort Oglethorpe* for instruction, Major C. A. L. REED, Cincinnati.

Oklahoma

To Camp A. A. Humphreys, Va., from Camp Grant, Lieuts. B. W. BAKER, Cloudchief; F. MOSLEY, Millerton.

To Camp Crane, Pa., Evacuation Ambulance Company, from Fort Riley, Capt. K. L. COLLEY, Bigheart.

To Fort Hamilton, N. Y., from Camp Grant, Lieut. A. S. SPANGLER, Pauls Valley.

To Fort Riley for instruction, Lieut. A. H. LARSKOW, Claremon.

Honorably discharged, Capt. H. D. SHANKLE, Hastings. On account of physical disability existing prior to entrance into the service, Lieut. R. A. WORKMAN, Woodward.

Oregon

To Camp Crane, Pa., Evacuation Ambulance Company, from Fort Riley, Lieut. H. H. HUGHES, Gresham.

To Camp Jackson, S. C., base hospital, from Fort Oglethorpe, Capt. H. G. PARKER, Portland.

Pennsylvania

To Camp Colt, Pa., from Camp Dix, Lieut. F. D. LOHR, Derry.

To Camp Crane, Pa., from Camp Custer, Capt. W. F. ROSS, Aspinwall; from Fort Oglethorpe, Capt. J. B. ROGERS, Pottsville.

To Camp Gordon, Ga., base hospital, from Fort Oglethorpe, Lieut. R. L. ANDERSON, Pittsburgh.

To Camp Meade, Md., evacuation hospital, from the Surgeon-General's Office, Capt. W. J. EZICKSON, Philadelphia.

To Fort Oglethorpe, base hospital, from Fort McPherson, Lieut. J. O. BOWER, Wyncote.

To Hoboken, N. J., from Camp Meade, Lieut. P. K. HELLER, Dixmont.

To Newport News, Va., from Fort Oglethorpe, Lieut. L. LASDAY, Pittsburgh.

To New York, Neurological Institute, for instruction, Lieut. M. McCUTCHEON, Philadelphia.

To Richmond, Va., from Camp Dix, Capt. J. M. TIMMONS, West Alexander.

To Rockefeller Institute for instruction in the treatement of infected wounds, and on completion to Camp Meade, Md., base hospital, for instruction, from Fort Oglethorpe, Capt. W. T. ELLIS, Jr., Philadelphia.

Honorably discharged on account of physical disability existing prior to entrance into the service, Capt. W. S. RUCH, Carlisle; W. A. LAROSS, McDonald; Lieut. W. R. McCLELLAN, Garrett.

Resignation of Lieut. E. P. DAVIS, Philadelphia, accepted.

South Dakota

To Fort Riley for instruction, Lieut. W. E. DONAHOE, Sioux Falls.

To Hoboken, N. J., base hospital, Lieut. G. E. VAN DEMARK, Sioux Falls.

Tennessee

To Camp Crane, Pa., evacuation hospital, from Fort Oglethorpe, Capt. J. H. KING, Nashville.

To report to the commanding general, Central Department, from Fort Riley, Lieut. E. C. MASON, Bon Air.

Honorably discharged on account of physical disability existing prior to entrance into the service, Lieut. O. M. LATEN, Memphis.

Texas

To Camp Crane, Pa., from Camp MacArthur, Major W. M. WOLF, San Antonio; from Camp McClellan, Capt. I. A. WITHERS, Fort Worth. Evacuation Ambulance Company, from Fort Riley, Lieut. O. HUFF, Castell.

To Camp Hancock, Ga., base hospital, from Fort Oglethorpe, Lieut. S. ISRAEL, Houston.

To Camp McClellan, Ala., base hospital, from Corpus Christi, Lieut. H. F. WILKINS, Fort Worth.

To Fort Oglethorpe for instruction, Lieut. L. H. LANIER, Texarkana.

To Newport News, Va., from Fort Oglethorpe, Capt. G. F. ST. JOHN, Harriman.

To report to the commanding general, Southern Deparment, Lieut. E. A. BENBOW, Luling.

To Walter Reed General Hospital, D. C., from Fort Oglethorpe, Lieut. R. E. HILBURN, Antelope.

Honorably discharged on account of physical disability existing prior to entrance into service, Capts. J. L. WOMACK, Edna; J. A. HARDY, El Paso; Lieut. J. A. MOORE, Jourdanton.

Utah

Honorably discharged on account of physical disability existing prior to entrance into the service, Lieut. E. A. WEYMULLER, Geneva.

Virginia

To Camp Crane, Pa., base hospital, from Fort Oglethorpe, Capt. P. W. BOYD, Winchester.

To Fort Benjamin Harrison, Ind., from Fort Oglethorpe, Capt. M. C. SYCLE, Richmond.

To Fort Monroe, Va., from Camp Lee, Lieut. M. GROVEHAGEN, Richmond.

To Hoboken, N. J., evacuation hospital, from Camp Pike, Lieut. E. M. HICKS, Jr., Roanoke.

Washington

To Camp Crane, Pa., Evacuation Ambulance Company, from Fort Riley, Capt. F. M. CROSBY, Kennewick.

To Camp Dodge, Iowa, base hospital, from Fort Oglethorpe, Capt. L. B. BALDWIN, Seattle.

To Mineola, N. Y., Hazelhurst Field, for instruction, from Vancouver Barracks, Lieut. J. D. BARNWELL.

West Virginia

Honorably discharged on account of physical disability existing prior to entrance into the service, Lieut. W. E. WHITESIDE, Harrisville.

Wisconsin

To Camp Crane, Pa., Evacuation Ambulance Company, from Fort Riley, Capt. E. A. KETTERER, Montford.

To Newport News, Va., from Fort Oglethorpe, Lieut. W. J. MURPHY, Milwaukee.

Honorably discharged, Lieut. M. A. FRONEY, Racine. On account of physical disability existing prior to entrance into the service, Capt. A. M. FOSTER, Racine.

Wyoming

To Camp Crane, Pa., Evacuation Ambulance Company, from Fort Riley, Lieut. W. LOWE, Sunrise.

To Fort Oglethorpe for instruction, Major E. M. TURNER, Laramee.

ORDERS TO OFFICERS OF THE UNITED STATES PUBLIC HEALTH SERVICE

Sen. Surg. G. A. Magruder, proceed to Washington, D. C., for conference regarding venereal disease control.

Surg. W. C. Billings, proceed to various cities in state of California to investigate the public health value of certain contemplated improvements.

Surg. E. A. Sweet, proceed to certain points in the states of North Dakota, South Dakota, Colorado, Nebraska and Kansas for conference regarding measures for influenza control.

Passed Asst. Surg. W. M. Jones, proceed to League Island Navy Yard for inspection of repairs for steamer *Neptune*.

Asst. Surg. R. E. Dyer, proceed to Englewood, New Jersey, and assume charge of Service operations in extra-cantonment sanitation.

Asst. Surg. M. C. Edmunds, relieved from further duty in the District of Columbia and proceed to Madison, Wis., for duty in measures for the control of influenza.

Acting Asst. Surg. Orlando Ducker, proceed to Richmond, Va., for duty in control of influenza.

Acting Asst. Surg. John W. Goltra, proceed to Elkins, W. Va., for duty in connection with the control of influenza.

Acting Asst. Surg. M. D. Hollis, proceed to Tampa Bay Quarantine Station and assume charge of the Service.

Acting Assst. Surg. J. T. McDonald, proceed to Kalawao, Hawaii, for the purpose of supervising leprosy investigation at that place.

Acting Asst. Surg. A. J. McLaughlin, proceed to Lincoln, Neb., to address the druggist convention at that place.

Acting Asst. Surg. Evelyn G. Mitchell, proceed to Harrisburg, Pa., for duty in connection with the control of influenza.

Acting Asst. Surg. B. F. Roberts, proceed to Madison, Wis., for duty in connection with the control of influenza.

Acting Asst. Surg. Julius Schiller, proceed to Harrisburg, Pa., for duty in the control of influenza.

Pharm. F. S. Goodman, proceed to the Marine Hospital, Louisville, Ky., for duty.

San. Engr. H. W. Streeter, proceed to Bethlehem, Pa., for the investigation of public health needs of certain contemplated improvements.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

Masks Compulsory.—During the height of the influenza epidemic in San Francisco in the latter part of October, by a proclamation of Mayor Rolph all citizens were required to wear masks in all places where they come in contact with others, whether on the street or on the inside of business or other places. Strict orders were given to the police to enforce the regulation.

ILLINOIS

Correspondence Schools Closed.—The International College of Osteopathy, the Columbia College of Chiropractic and the Illinois College of Somapathy, correspondence schools, heretofore located at Elgin, are reported to have closed and to be about to surrender their charters.

Physician Gives Home for Negroes.—Dr. William E. Quine, Chicago, is reported to have deeded his residence at 3160 Indiana Avenue, to the Chicago Home Missionary and Church Extension Society of the Methodist Episcopal Church, to be used as a social center for negroes.

Illegal Practitioner Fined.—A raid on one of the offices and medical museums said to be backed by Emil Hellisher, Hammond, Ind., was made at Joliet, recently. M. A. Chaiken, assistant registered pharmacist, is said to have been fined $75 and costs for practicing medicine without a license.

Personal.—Dr. H. Gideon Wells, Chicago, is leaving in a few days for the Balkan States, as a member of the Balkan Commission of the American Red Cross.——Dr. Graham M. Lisor, East Moline, formerly a member of the staff of the Elgin State Hospital, has been appointed superintendent of the St. James (Minn.) Hospital and Sanitarium.——Lieut.-Col. Philip Schuyler Doane, M. C., U. S. Army, Chicago, head of the Health and Sanitation Division, Industrial Relations Group, U. S. Shipping Board, Emergency Fleet Corporation, will, it is reported, sail for France, next month, to assume command of an evacuation hospital.——Lieut.-Col. Edmund J. Doering, M. C., U. S. Army, Chicago, is reported to have been appointed district medical officer, Personnel Branch, Operations Division, of the General Staff.

INDIANA

License Revoked.—The license to practice medicine in Illinois, of Dr. Edward D. Porter, Indianapolis, is said to have been revoked, October 15.

Personal.—Dr. Charles C. Morris, Rockville, is reported to be critically ill with influenza.——Dr. Hugh D. Wood, Angola, is said to be seriously ill at his home.

Mental Hygienists to Meet.—The third annual meeting of the Indiana Society of Mental Hygiene will be held in Indianapolis, December 16, under the presidency of Dr. William T. Bryan, Bloomington, president of the State University.

MARYLAND

Influenza Ban Lifted.—The influenza ban has been entirely lifted in Baltimore by the health department and schools and colleges have been reopened. The cases reported on the first had dropped to fifty-eight and the deaths to forty-two, and conditions, it is felt, will be normal within the next day or so.

Hospital Train at Chambersburg.—At the request of Surg.-Gen. Rupert Blue of the United States Public Health Service, the Maryland Council of Defense has sent its hospital train to Chambersburg, Pa., where influenza is reported as being very prevalent. The train has been at Cumberland and other points in western Maryland. Conditions throughout the state have improved to such an extent that the train is no longer needed in the counties.

Personal.—Capt. George L. Stickney, Baltimore, of the U. S. Army Medical Corps, formerly from Baltimore, who was severely injured at the battle of Soissons, has entirely recovered and has been transferred to new duty. He is now serving in a replacement camp with U. S. Military Hospital No. 47.——Rear Admiral Albert M. D. McCormick, veteran medical officer at the Naval Academy, has received orders to proceed to duty with the naval forces overseas. Admiral McCormick has been on duty at Annapolis almost continuously for more than a score of years.

MASSACHUSETTS

Increased Pay for Medical Examiners.—The legislative action authorizing the city of Boston to increase the salaries of medical examiners, George B. Magrath and Timothy Leary and their assistants, was accepted by the council, September 23. By the provision of this act, Drs. Magrath and Leary will receive a salary of $6,000 instead of $4,500 as heretofore.

Personal.—Dr. John J. Carroll, Holyoke, acting assistant surgeon, U. S. P. H. S., has been appointed chief of the subdivision of venereal diseases of the state department of health, to succeed Major Alec Nicol Thomson, who was placed in charge of the work of correlating the efforts against the venereal diseases in behalf of both the Army and Public Health Service.——Dr. Lily Owen B. Burbank, East Bridgewater, has been appointed director of educational work for the women of the subdivision of the venereal disease of the state department of health.——Dr. Esther M. E. Sundelor, Fall River, roentgenologist at the Truesdale Hospital and Clinic, Fall River, has returned to her work after a summer spent at St. Anthony Hospital, Labrador.——Dr. Charles H. Winn, Roxbury, Boston, has been appointed high medical examiner of the Massachusetts Catholic Order of Foresters.

Massachusetts Health Committee.—During the summer there was organized a health committee to conduct a health campaign in the state, under the auspices of Dr. Eugene R. Kelley, state commissioner of health. This committee will work along educational lines and will carry on a vigorous campaign of lectures, exhibits, newspaper publicity and circular work. The committee will act in advisory capacity to less experienced organizations, and will aim to be "a clearing-house for public health ideas." The officers of the committee are Dr. Eugene R. Kelley, chairman; Miss Gertrude W. Peabody of the Child's Welfare Department, Council of National Defense, treasurer; Prof. Charles E. Bellatty of Boston University, director of publicity; Bishop William Lawrence, representing the Society of Social Hygiene; Dr. Edward Reynolds, Boston, director of the American Society for the Control of Cancer; Dr. George M. Kline, Boston, director of the Massachusetts Committee on Mental Disease; Dr. Vincent Y. Bowditch, Boston, president of the Massachusetts Anti-Tuberculosis League, and Dr. Richard M. Smith, Boston, member of the Child Conservation Committee of the state department of health. Funds have been made available to meet all expenses of the work, which began in July. Dr. Edward Reynolds is chairman of the board of directors. The headquarters of the committee are at 525 Boylston Street, Boston.

MICHIGAN

Influenza Prophylaxis.—It was reported from Flint, October 26, that at the Michigan School for the Deaf, with 300 pupils and fifty employees, not a single case of influenza had developed on account of the fact, it is believed, that every person connected with the institution was required to wear a face mask following the order of the board of health, October 17. No other preventive measure was used.

MISSOURI

Personal.—Dr. Henry L. Wolfner, St. Louis, has been elected president of the St. Louis Board of Education.

Advocate Use of Serum.—The St. Louis Medical Society, October 23, appointed Dr. C. H. Smith, assistant health commissioner, Elsworth S. Smith, William Engelbach, George Ives, and Charles W. Schery, a committee to further the use of the new serum to prevent deaths from pneumonia in influenza cases.

Arrest of Physicians Ordered.—Orders are said to have been issued by the St. Joseph Board of Health, October 24, directing the city health officer, Dr. Hasbrouck De Lamater, to swear out a warrant for the arrest of Dr. Clayton F. Imus, charged with failing to report a case of influenza, and Dr. Reinhold Willman, charged with tearing a quarantine sign from a house without permission from the board of health.

State Board Election.—At the annual meeting of the state board of health, held October 16, Dr. William A. Clark, Jefferson City, was elected president; Dr. Andrew W. McAlester, Columbia, vice president, and Dr. George H. Jones, secretary

(reelected).——The board decided that the precautionary measures instituted on account of the epidemic of influenza should be continued for an indefinite period.——The board has withdrawn its recognition of the St. Louis College of Physicians and Surgeons.

St. Joseph Physicians Form Unit.—Dr. William J. McGill, St. Joseph, has organized and will direct a Naval Station Unit, the personnel of which is composed of Lieut.-Com. William J. McGill, director; Lieut.-Com. Clarence A. Good, chief of the medical section; Lieut. L. Robert Forgrave, eye, ear, nose and throat specialist; Lieut. Julius S. Weingart, Des Moines, Iowa, specialist in laboratory and pathology. This unit will serve either on hospital ships or in base hospitals in this country or overseas. Additional assistants will be assigned if needed by the Surgeon-General, and nurses will be furnished by the American Red Cross.

NEW YORK

Diphtheria in Troy School.—There has been an outbreak of diphtheria among the 700 students of the Rensselaer Polytechnic Institute, who are enrolled in the Students' Army Training Corps. The Schick test is being applied to every student, and those who are found susceptible will be immunized.

New York City

Personal.—Dr. Charles H. Chetwood, former head of the department of urology of the New York Polyclinic Hospital, has been appointed consulting surgeon to the French Hospital.

Government Takes City Hospital.—The federal government is about to take over North Brother Island from the city and will maintain the Riverside Hospital as a military institution. The Riverside Hospital has accommodations for 1,000 patients.

Society Rejects Council Report.—Members of the Kings County Medical Society at a meeting, held October 15, are reported to have refused to accept a recommendation of the council of the society that the investigation of Dr. James P. Warbasse be dropped, and to have voted to accept a report that the charges against the physician were well founded.

National Committee for the Prevention of Blindness.—This organization will hold its annual meeting, November 26, at 8:30 p. m., at the New York Academy of Medicine, New York City. The chief speaker of the occasion will be Lieut.-Col. James Bordley, M. C., U. S. Army, Baltimore, whose subject will be "The Government and Red Cross Work for Blinded Soldiers."

OHIO

Smallpox.—At Elyria, October 26, there were nineteen houses under quarantine on account of smallpox, and the total number of cases in the city was twenty-six.

Illegal Traffickers in Drugs Punished.—October 23, Drs. George S. Iddings, T. A. Harris, Horace C. Bliss, and Miss Sarah Wilkins, a nurse, all of Cleveland, were charged with unlawful traffic in morphin and other drugs. Dr. Iddings is said to have pleaded guilty and sentenced to pay a fine of $500 and to thirty days imprisonment in jail; in the case of Dr. Harris a fine of $100 and costs and imprisonment for thirty days was held in abeyance pending a hearing of a motion in mitigation; a fine of $50 and costs in the case of Miss Wilkins was suspended; and in the case of Dr. Bliss, who pleaded not guilty, the case was continued until November 12.

Personal.—Dr. Adam W. Montague, receiving physician at the Cincinnati General Hospital, has resigned.——Dr. Ira H. Hawes, Arcanum, sustained serious injuries by the overturning of his automobile near Ithaca, October 20.——Dr. Daniel Heimlich, Cleveland, is ill with pneumonia at Mt. Sinai Hospital.——Dr. Foster D. Keiser, Tippecanoe City, is reported to be ill with pneumonia, following influenza, at the home of his brother in Piqua.——Dr. William C. Coultrap, Columbus, is reported to be critically ill with influenza at Mt. Carmel Hospital.——Dr. Roscoe R. Kahle has been appointed by the board of administration consulting surgeon to fill in for major surgery in any of the state institutions.——Dr. Oscar M. Craven, District Physician for the Cincinnati Health Department, has been appointed assistant health officer.——Dr. Carrie A. Richeson, Bellefontaine, has been elected secretary of the Logan County Medical Society to fill the unexpired term of Dr. Guy J. Kent, deceased.

PENNSYLVANIA

Personal.—Dr. Frank C. S. Blessing, Pittsburgh, is reported to be ill with pneumonia.——Dr. Edwin S. Dorworth, Bellefonte, is reported to be critically ill as the result of a cerebral hemorrhage.

Influenza Hospitals Opened.—The Mid-Valley Emergency Hospital, Olyphant, was opened to receive patients, October 17. Dr. Frederick L. Van Sickle, Olyphant, is in charge of the institution.——An emergency hospital for Conshohocken was opened in the Conshohocken Baptist Church, October 14, with Dr. George N. Highley in charge.

Philadelphia

Personal.—Dr. Harry Lowenburg has recovered from his recent illness and has resumed practice.——Dr. Edward Martin has resigned as John Rhea Barton professor of surgery in the University of Pennsylvania, and Dr. John B. Deaver has been elected his successor.——Dr. Allen J. Smith has been elected dean of the Medical School of the University of Pennsylvania.

Good Work in Influenza Epidemic.—The College Hospital of the Woman's Medical College has just closed its emergency hospital, established in cooperation with the Sun Shipbuilding Company during the influenza epidemic. The hospital was located on the river front just behind the transport docks.——The three upper college classes were mobilized for hospital service in the first days of the epidemic, and it was therefore possible to run the main college hospital to its full capacity with special wards equipped in the gymnasium, together with the emergency hospital in the poorest quarters of the city. Senior students were also sent as aids to physicians in the more severely stricken parts of Philadelphia. Hospital aids trained in the wards of the hospital during the previous winter together with other volunteers gave needed relief to regular nurses and evening auto trips provided by the Red Cross of Cynwyd reduced the morbidity and mortality among the nursing staff to a minimum. Two women ambulance drivers maintained the service night and day throughout the epidemic.

Cooperation of Medical Students in the Epidemic of Influenza in Philadelphia.—At the height of the influenza epidemic, October 2, at the request of Major Griffith, military commandant at the University of Pennsylvania, Dr. H. C. Wood, Jr., professor of pharmacology and therapeutics, organized an influenza emergency hospital, at first to take care of the students in the university who became ill and who could not be admitted to other hospitals on account of their crowded condition. The hospital was opened in a fraternity house which was being prepared as a barracks for the Student Army Training Corps. This hospital was made ready within twenty-four hours and was soon filled, on account of the rapid increase in the number of cases at the university and throughout the city. October 6, a call was issued for all third and fourth year medical students to report to the hospital where they were organized for service, not only in the university, but throughout the city. From these classes seventy-two men were supplied to the Red Cross Hospital, thirty-eight at various other city hospitals doing emergency work, and nine at other hospitals in the immediate vicinity of the university. This was in addition to those employed on the campus. In all, nineteen hospitals were supplied, either in whole or in part, with residents and interns from the members of the two classes. Many of the students visited private patients under the auspices of the city board of health, University Settlement, and some other organizations. These men were employed not only as interns, but also as nurses and orderlies and did other necessary work in caring for the influenza patients during the emergency, working long hours and showing the greatest spirit of self sacrifice. A number of them became ill in the performance of their voluntary duties.

WASHINGTON

Medical Society Facing Charges.—The Washington Hospital Association has requested that the King County Medical Society be permanently enjoined from further alleged acts, and also asked that a mandatory injunction be issued compelling the association to restore to full membership Drs. J. C. Moore, Frederick A. Cook, R. P. McClain and W. E. McClain, who were suspended last summer for having, it is alleged, served the association. The association charges the members of the King County Medical Society are being coerced to withdraw and keep their services from the association.

Personal.—Dr. Alice M. Smith, Tacoma, has been elected a fellow of the North British Academy of Arts, and an honorary member of the council.——Dr. Alexander R. Lundgren, Spokane, is reported to be seriously ill at his home with pneumonia.——Dr. Edward P. M. Condon, Spokane, is ill at the Sacred Heart Hospital with pneumonia following influenza.——Dr. William W. Webb is reported to be seriously ill with influenza.——Dr. Miles U. Lieser, Vancouver, who has been critically ill with influenza, is reported to be improved. ——Dr. Ida N. McIntire is said to be seriously ill at her home in Everett.

CANADA

Memorial Tablet.—The Regina (Sask.) Medical Association will erect a tablet in the local General Hospital to the memory of Dr. E. E. Meek, Regina, who was killed in France while operating on a wounded soldier in a Red Cross Hospital bombed by German airmen.

Must Be Military Surgeons Only.—It is reported from Ottawa that the Federal military authorities will require that all military physicians in Canada who are on the pay roll, will in future be required to devote their whole time to their military duties and discontinue their private practices. The order issued reads as follows: "No medical officer who is engaged in civil practice will be permitted to draw full time pay and allowance except when sent for temporary duty away from his home station."

Personal.—Lieut.-Col. Charles S. McVicar, Toronto, who returned from overseas recently where he was on the Orpington Hospital staff, has been appointed senior physician at the Spaldina Military Hospital, Toronto.—— Dr. Roy H. Thomas, who has been overseas between two and three years, has been awarded the Military Cross.——Capt. J. H. Box, Lieut. Hendry Connell, Kingston, Ont., and Major Wellington M. Carrick, M.D., Hamilton, Ont., have gone as medical officers with the Canadian Siberian Expedition.

Tablet to Soldier Poet.—A memorial tablet has been placed in the Royal Victoria Hospital, Montreal, in honor of Col. John McCrae. It contains the following inscription: "In memory of Lieut.-Col. John McCrae, assistant pathologist and assistant physician, 1904-1917, chief of the medical division No. 3, McGill Canadian General Hospital, Boulogne, France, consultant of the First Army. Died on active service in France, Jan. 28, 1918." Then follow the stanzas of Colonel McCrae's famous poem, "In Flanders Fields."

GENERAL

Unauthorized Solicitor Appointing Medical Examiners.—We are informed that an individual signing himself "W. W. Beck" is appointing physicians as medical examiners of the Colonial Guards of America, soliciting a fee of $5. When last heard from he was working in Ohio. Mr. F. L. Runyon, secretary of the Colonial Guards of America, states that Mr. Beck is not authorized to solicit for the organization.

Missouri Valley Physicians Elect New Officers.—At the thirty-first annual meeting of the Medical Society of the Missouri Valley, held in Omaha, September 19 and 20, Des Moines was selected as the next place of meeting, and the following officers were elected: president, Dr. Charles Wood Fassett, Kansas City, Mo.; vice presidents, Dr. Elbert J. Watson, Diagonal, Iowa, and Dr. Joseph M. Aikin, Omaha; secretary, Dr. S. Grover Burnett, Kansas City, Mo., and treasurer, Dr. Oliver C. Gebhart, St. Joseph.

Bequests and Donations.—The following bequests and donations have recently been announced:

The City of Duquoin, Ill., $200,000 for a hospital for the city by the will of Mrs. Lillie A. Browning, Chicago.

Federation of Jewish Charities, Philadelphia, 4 per cent. of the income from the real estate of the late Samuel Sternberger, not to exceed $1,000 annually; Jewish Hospital Association 2 per cent. of the income from the same source not to exceed $500 annually. Also a payment of $20,000 to the Federation of Jewish Charities, and $10,000 to the Jewish Hospital Association, only the interest from these funds to be used.

Federation of Jewish Charities, Philadelphia, a bequest of $2,500 by the will of Eva K. Coons.

Influenza.—The influenza epidemic seems to be subsiding generally throughout the country and places heretofore closed have been opened gradually. November 2, the new cases of influenza reported from the Army camps for the previous twenty-four hours was 1,577 against 2,076 for the twenty-four hour period preceding that. The new pneumonia cases were 292, an increase of 12. The deaths for November 2, were 103, equalling the total for the previous day, but making a low record for influenza. October 30, according to the report of the emergency public health committee, approximately 11,000 deaths from influenza had occurred in Massachusetts, but it has now almost subsided. October 11, it was reported from Cape Town that influenza was spreading with alarming rapidity throughout South Africa.

Allied Surgeons Tour America.—A party of eminent surgeons from abroad has been making a tour of the United States acompanied by Lieut.-Col. George E. Brewer, M. C., U. S. Army, New York City; Col. William J. Mayo, M. C., U. S. Army, Rochester, Minn.; Col. Franklin H. Martin, M. C., U. S. Army, Chicago, and Dr. Pilcher, New York City. They have been entertained and have delivered addresses on various phases of military surgery in St. Paul, Rochester, Philadelphia, Chicago, New York, and other cities. The party consists of Col. Sir Thomas Myles, Dublin, Ireland, Major G. Gray Turner, New Castle-on-Tyne, England, Col. George E. Gask, St. Bartholomew's Hospital, London, Prof. Raffaele Bastianelli and Major Pouletti, Rome, Major Pierre Duval and Lieut. Henri Beclere, Paris, and Major Poillet, Ambre, France.

FOREIGN

War Fund for Physicians.—The *Nederlandsch Tijdschrift* quotes a German exchange to the effect that the Leipzig League is appealing urgently for contributions to its war fund to aid physicians, saying that the monthly appropriations from it are already 5,000 marks, and the demand is increasing week by week. Funds are needed also for aid to physicians' families, especially for widows of physicians.

Increased Legal Rates for Medical Services in Prussia.—According to the *Nederlandsch Tijdschrift*, the Prussian minister of the interior has ordered that the minimum payment for medical services by the state, insurance companies, charitable institutions, etc., is to be raised by 50 per cent. after September 1. This increased rate is to prevail for a year after the war. The maximal remuneration for specialist work is also increased. By mutual agreement the maximum rates can be surpassed, but in case of dispute the legal tariff is a guide to the courts.

Death of British Naval Officer.—Surg. John Hadwen, lieutenant-commander, Royal Navy, senior surgeon on *H. M. S. Lancaster*, in service on the Pacific Station, died at the Agnew Sanatorium, California, October 23, from pneumonia following influenza. Dr. Hadwen was 35 years of age; M.B., B.S., M.R.C.S., L.R.C.P. (Lond.), 1907. An international funeral service was held, October 24, participated in by Rear Admiral William Fullam, U. S. Navy, with his staff, and Admiral B. H. Holcomb, Royal Navy, with his staff and companies of sailors from the *U. S. S. Oregon* and *H. M. S. Lancaster*.

SOUTH AND CENTRAL AMERICA, MEXICO AND WEST INDIES

Standardization of Antiserums in Uruguay.—The *Revista Medica del Uruguay* states that the Consejo Nacional de Higiene has now made definite arrangements for the control of the production and sale of therapeutic serums made in Uruguay, and of conditions to regulate their sale in other countries.

Student Congress.—The *Revista Medica del Uruguay* relates that arrangements are under way for a general gathering of the students of the universities of the countries which owe their liberty to Bolivar, namely, Ecuador, Bolivia, Peru, Colombia and Venezuela. The University of Guayaquil has taken the lead in the matter.

Radium Loaned by Uruguay to Brazil.—Dr. C. Butler, director of the Radiology Institute of Montevideo, was sent recently to Rio de Janeiro with the amount of radium which the Facultad de Medicina of Montevideo was empowered by the government to loan to the Facultad de Medicina of Rio de Janeiro. The university authorities invited him to deliver an address on the results achieved with radium in Uruguay, and he described with lantern slides the work done at the institute in his charge.

CORRECTION

Marriage Notice Incorrect.—THE JOURNAL for October 19 contains announcement of the marriage of Lieut. Maurice Rashbaum to Miss Justine Todd. The announcement was based on a letter received by THE JOURNAL, signed L. Todd. We are requested both by Miss Todd and by Lieutenant Rashbaum to state that the announcement was incorrect.

BUENOS AIRES LETTER

Buenos Aires, Sept. 13, 1918.

University Interchange

Since last year there has been established an active interchange of professors between the medical departments of the universities of Buenos Aires, Rio de Janeiro and Montevideo. During the current year Dr. Etchepare, professor of psychiatry at Montevideo, and Dr. Austregesilo, professor of clinical neurology at Rio de Janeiro, have delivered lectures in Buenos Aires. The latter is still in the city. One of his lectures was on "Vagotony," one on "Studies of the Reflexes" and one is announced on "Cataphrenias."

On the occasion of the second South American Conference on Hygiene, Microbiology and Pathology, which is to convene at Rio de Janeiro, October 15, at the same time as the eighth Brazilian Medical Congress, several Argentine professors are to go to Rio, among others Drs. Araoz Alfaro, Zarate, etc. The national government has sent various delegates.

The local Facultad de medicina has arranged with the facultad of the University of Montevideo for an annual interchange of some of the professors.

Changes in the Medical Staff of the University

When the time came for election of the dean of the Facultad de medicina of Buenos Aires, the minister of public instruction requested that the election should be postponed until after the approbation of the reform of the statutes of government of the universities which had been submitted for government approval and action. This request for delay was badly received by some of the professors, and they sent in their resignation. As the dean, Dr. Bazterrica, had completed his term and no one had been appointed to succeed him, the oldest member of the staff, Dr. Eliseo Canton, was called to the direction of the school.

Infant Mortality

In view of the increase in infant mortality in the last few years, the Sociedad de Pediatria is to devote some special meetings to the study of this medico-social problem. They have invited other medical associations of the country and of Uruguay to take part in the conferences.

The Sociedad Eugenica Argentina has just been founded.

MADRID LETTER

Madrid, Oct. 1, 1918.

Epidemic Influenza Swoops Down on Spain Anew

After the subsidence of the epidemic of influenza in Spain last spring, the summer was extremely dry, the drought being worse than even the oldest inhabitant could remember, and the epidemic of several months before flared up again, and this time in a severer form. It seems that the Pfeiffer bacillus alone or associated with the pneumococcus and streptococcus is producing in certain localities a form of influenza that is fatal in a few hours. As I am writing there are some towns in which every inhabitant has been stricken, and others in which of the total of 500 inhabitants, only seventy or eighty are still on their feet. All the others are sweating and shivering in their beds, waiting for the visit from the doctor, always the true hero and today as ever the victim of a still imperfect sanitary organization. The disease at its first outbreak seemed to yield to the extreme hot weather, but in this second outbreak it has spread throughout the whole of Spain, this wide diffusion favored by official inefficiency and irresponsibility, which ought to be penalized. Nothing of the kind will be done, however, as politics and the dependent situation of the medical officers, subordinate to the civil authorities, impede the regular and systematic functioning of the public health service, which otherwise might have checked the advance of this second epidemic of grip. Notwithstanding the official decrees that the local authorities are to inform the central national authorities when there is a change in public health conditions in their respective regions, many, very many mayors, in order not to interrupt some local festival or shorten the stay of resorters, have kept silent in regard to the presence of the epidemic, threatening the local health officer that he is not independent and is not free to express his views on the arbitrary conduct of the local authorities, often heedless or ignorant of sanitary problems.

The Spring Epidemic of Influenza

Toward the close of last spring the whole of Spain was invaded by a disease sudden in its appearance, brief in its course, and subsiding without leaving a trace: general malaise, headache, pains in joints and muscles, high fever, slight bronchitis, much sweating and . . . after three days we were out again, a little weak and pale, and telling our friends how we had just had the . . . the . . . What should we call what we had been having? Some name had to be found, and the Madrilenians, as a joke, soon found a name for it. Not long before there had been a musical comedy at one of the theaters, "The Song of Forgetfulness," and one of its numbers, the "Soldier of Naples," sung by a patrol of soldiers, became very popular and was hummed, whistled and played until every one became deathly tired of it. As every one had become deathly tired of the disease we had been having, and as no one seemed able to escape from the tune or the disease, the latter was dubbed "the Naples soldier" too.

THE PANDEMIC OF INFLUENZA

When the epidemic in Spain subsided with the onset of the heated term, every one supposed that the calamity was over, and we were surprised to learn that the disease was making ravages in other countries, and that people there were calling it the "Spanish grip." And wherefore Spanish? Was it not the same grip that Chauffard had observed in Paris and had reported at a meeting of the Société médicale des hôpitaux several weeks before it had made its appearance in Spain? The germ may have increased its virulence and its power of diffusion in Spain, but it is evident that this epidemic was not born in Spain, and this should be recorded as a historic vindication. The extraordinary spread of epidemic influenza and its alarmingly rapid propagation are due to the fact that, as the bacilli are installed in the pharynx and as one of the characteristics of the disease in its incipience is a tickling in the throat, a slight pharyngotracheitis, there is a frequent impulse to cough and hawk, before the general health is impaired so that one has to stay in bed. This coughing relieves the tickling in the throat, but at the same time it spreads droplets of the secretions around and with them the dangerous bacilli, which are inhaled by healthy persons and multiply in them. Expectorated sputum, as also the expelled droplets, dry on the ground and the bacilli on them get breathed in dust. It is obvious that in offices, theaters, street cars, cafés, etc., the epidemic encounters the most favorable conditions for its diffusion.

From all over Europe news came to us that our guest, the famous "soldier," had been converted from "Neapolitan" into "Spanish," and we heard of the same diversities of opinion and judgments as we had in our own home. But now—we thought—we could be tranquil spectators, instead of actors, not knowing of the second representation of the comedy, which was even then preparing for us and which soon turned into a tragedy. This confirmed what Dr. Cortezo, the president of the Academia de Medicina and director of the *Siglo Medico* had said in regard to the menace of aggravation of the epidemic when it seemed on the point of disappearing, which had been a feature of other epidemics of influenza.

MORTALITY OF THE EPIDEMIC

A few days after the first cases we learned that some friend with heart disease had succumbed to the "soldier"; then we heard of others with chronic bronchitis, kidney disease or other taints, and in a week from the first case the death rate of the city had doubled. The physicians were exhausted, the druggists had to get extra help, and the city and state executive offices were closed, as also offices of all kinds, shops, schools and theaters. Even the famous "soldier song" was not heard any more. The laboratories collected material for research on the exact diagnosis and published varied and picturesque reports in the daily papers. According to some it was a tropical disease, others regarded it as the immediate effect of meteorologic conditions, some ascribed it to a certain species of mosquito while at that time none of those mosquitoes were to be found in Madrid; others attributed it to some insect prevalent in the Balkan states, and there were even some chemical authorities who attributed it to asphyxiating gases.

REPORT OF SCIENTIFIC SOCIETIES

The highest authority in medical matters in Spain, the Academia Nacional de Medicina, declared that it was the grip, the features of the epidemic being closely analogous to those of the pandemic of 1889 and 1890 which the majority of the members remembered. The association comprising younger men, the Academia Medico-Quirurgica, accepted the same diagnosis, and Dr. Falco presented specimens showing the Pfeiffer bacillus more distinctly than had been possible hitherto, and the findings were positive in nearly every case examined.

FALCO'S BACTERIOLOGIC TECHNIC

Falco follows Pfeiffer's original technic as modified by his pupil, Scheller. The main point is to rinse the sputum thoroughly and disintegrate it, first in saline and then on the slide. The bacillus is generally ensconced in the very center of the masses of sputum, and the mucin prevents the stain from reaching the bacillus. Hence the enormous difference between the findings of those who take pains in this direction and those who prepare the specimens with defectively disintegrated and washed sputum. Falco does not apply the Pfeiffer procedure with dilute fuchsin at once, but applies the Gram method first, and then the Pfeiffer dilute fuchsin technic.

For inoculation of agar he uses an emulsion of the sputum in sterile bouillon. Thanks to the predominance of the Pfeiffer bacillus over all others, this dilution favors pure cultures. Instead of inoculating the agar as Pfeiffer does and then adding a few drops of blood taken directly from the wing of a pigeon or the human finger, Falco first hemolyzes the blood, as the hemoglobin is the only element in the blood that is necessary for the proliferation of the Pfeiffer bacillus. Falco hemolyzes the blood and mixes it with the agar to begin with. He collects 10 or 12 drops of blood from a vein in the wing of a dove, drawing it directly into a test tube containing 15 or 20 c.c. of distilled water. He agitates the blood, which thereby becomes defibrinated and hemolyzed, and it is then mixed with 100 or 120 c.c. of agar, melted and cooled to 55 C., which is then poured rapidly over the plates.

LONDON LETTER

LONDON, Oct. 8, 1918.

The Prevention of Venereal Disease Among Soldiers

The prevention of venereal disease in the army and navy is a problem that has always exercised the authorities, and of course during this greatest of wars has received increased attention. Under the Defense of the Realm Act (an act giving the government special powers during the war), a regulation known as 40 D has been in force for some months. According to this regulation, "no woman who is suffering from venereal disease in a communicable form shall have sexual intercourse with any member of His Majesty's Forces or solicit or invite any member to have intercourse with her." The excellent intention of this regulation has proved most difficult to carry out. In only four out of the first eight cases in which charges arising out of it were made was a conviction obtained. Subsequently a lawyer acting for the police in a case said that in his experience prosecutions under the regulation had not turned out satisfactory; of five cases conducted by himself, all had failed. The difficulty was due to the time elapsing between the inception of the disease in the man and the examination of the woman. Commenting on this, the *Lancet* states that in a large proportion of cases it has proved impossible to establish the existence of "venereal disease in a communicable form," although some of the women were demonstrably leading a disorderly life. It adds that a searching bacteriologic examination involving the use of the vaginal speculum and the expression of secretion from the urethra and cervix may fail to establish evidence of infection in cases in which clinically it is almost certainly present. This is in harmony with the difficulty—according to some the impossibility—of curing gonorrhea in the female. Apart from the fact that the woman may be merely a carrier of infection without at any time clinically suffering, it may frequently happen that an infective spot is present in the genital tract beyond the reach of the most exhaustive examination. In other words, the coitus test is more delicate than the bacteriologic. Under the regulation, "a woman charged with an offense shall be remanded for the purpose of such medical examination as may be requisite for ascertaining whether she is suffering from such a disease"; but as no examination suffices to ascertain the presence of infection, the *Lancet* considers that this discredits the regulation as a public health measure. Furthermore, difficulty may arise as to positive medical evidence. Even when the woman is shown to be infectious, the length of time between inception of the disease and examination may leave the physician in doubt as to which party infected the other. The *Lancet* further considers that the examination of a woman not for the purpose of treatment and therefore not in her own interest, is a legal measure that does not commend itself to the moral sense of the majority of the profession.

The dangers to which soldiers are exposed by solicitation in the streets has been discussed in the *Times*. An American in this country, Mr. Bok, editor of the *Ladies' Home Journal*, wrote condemning very strongly the temptations to which American soldiers are exposed in the London streets and contrasting the conditions unfavorably with those in the neighborhood of the camps in America. He was answered, however, by another American editor, who said that the great American cities were in no way better than London. I may add that on personal inquiry at one of the American hospitals in London I have ascertained that the percentage of venereal disease among the patients is very small.

Pharmacy and the War

At the opening of the seventy-seventh session of the School of Pharmacy of the Pharmaceutical Society, Dr. Addison, the minister of reconstruction, delivered an address. He said that the greatest danger to much of our trade and industry had been German organization, training and method, especially in the application of physical science. Without being original themselves, the Germans took hold of the ideas of others, often British in their origin, and applied and developed them with painstaking thoroughness, so that in many British industries they had been gradually acquiring greater power than they would ever have gained by force of arms. The British nation needed a far more thorough and comprehensive application of science to industry and production in an organized form than they had hitherto sought to obtain. He spoke of the rude awakening in this country soon after we went to war because of our depending on Germany for many of the most commonly prescribed drugs and chemicals, and of the methods that had been successfully taken to cope with the difficulties arising from this cause. The result is that today there are none of those medicinal preparations of great importance that are not being made in amply sufficient quantities in this country. As examples he mentioned acetylsalicylic acid, salicylic acid and procain. Much progress has also been made in the home production of many wild plants, such as belladonna, so that the supply of many of these is fully adequate to our needs. The story of the combat with the deficient drug supply would provide a most interesting and attractive example of many of our national achievements during the war. The particular lesson standing out is that we must have a much better supply of trained chemists. When at the beginning of the war the British government advertised for trained chemists at a salary of $15 a week, this was a striking example of the kind of estimate the country at that time had formed as to the place of science in industry.

PARIS LETTER

PARIS, Oct. 3, 1918.

Did Grip of 1890 Confer Immunity?

The most extravagant stories have been circulating among the public with regard to the present epidemic of influenza, as though it were an entirely new disease. In reality it has long been known. As early as 1643, Etienne Pasquier described certain epidemics in which it is easy to recognize influenza. The Académie de médecine devoted to discussion of it nearly its entire meeting, October 1. Netter confirmed the absolute identity of the present epidemic with the one that raged in Paris in 1889-1890. In fact, the small number of cases occurring among old persons at this time may be taken to indicate that immunity to the disease was established by an attack dating back to the previous epidemic. This fact, of itself, would confirm the identity of the present disease. The course of the two epidemics is identical: Cases are benign at first, pulmonary complications later darkening the prognosis; there are intestinal complications, often with dysenteric characteristics; there is extreme contagiousness, to which physicians and nurses pay heavy tribute, and, finally, from the bacteriologic point of view, the bacillus of Pfeiffer is found in about half the cases. The progress of the epidemic cannot be followed from country to country, as was the case twenty-five years ago, this time, however, because of the military happenings. But there is no reason whatever for designating the disease "Spanish influenza or grip," when it is well known that it raged in Germany and in France before it occurred in Spain.

Drs. R. Wurtz and Fernand Bezançon have made an investigation of certain cases occurring in the hospitals of Paris, which by their unusual severity and the predominance of certain symptoms gave rise to the belief among the laity that the disease is cholera. This assumption is absolutely a wrong one. It is based entirely on the coexistence of the intestinal and pulmonary form of grip or of dysentery with cyanosis; but in every case, laboratory investigation has

shown that there is not a single trace of any pestilence or exotic disease.

In the very severe cases, complicated by pulmonary edema, Dr. Ravaut advocates prompt bleeding, the withdrawal of from 500 to 700 gm. of blood, or even more, sometimes repeating the process. He also prescribes at the same time acetylsalicylic acid, if the kidneys are not affected, and hexamethylenamin when the urine is scanty and albuminous, the drug being administered orally or intravenously. Bleeding, in his opinion, is indicated in all cases of influenza of the congestive type accompanied by a frequent dry cough with beginning cyanosis.

The Food Supply

A very important step has just been taken to unify the means of provisioning the nation. A decree published in the *Journal officiel* provides that the minister of agriculture and food commissioner, who already is in charge of the provisioning of the armies in the field and of the civil population, shall also have charge of the provisioning of the ordinary troops and of the establishments of the Service de Santé. This will do away with the competition in the purchase of foods—which still exists—and finally unites the various services under one direction, unifying the various organizations that have hitherto had parallel functions in the distribution of food, placing on a common basis all goods, storehouses and personnel. The *magasins d'approvisionnement* of the Service de Santé, established in January, 1917, by M. Justin Godart, then undersecretary of state of the Service de Santé militaire, will cease to be the exclusive property of the military hospitals and of the Red Cross, but will be used, with all their resources, for general provisioning. They will be added to and merged with the regional *magasins* (storehouses) already established by the food commissioners in charge of the food supply for the civil population. This reform will make it possible to use the national resources to the best advantage, to fight the high cost of living, and, to a certain extent, it will help to lessen the difficulties of apportioning food between the various classes of consumers.

Exceptional Service Decorations for Medical Officers

M. Jean Ossola, deputy, has made his report in the name of the Commission de l'armée appointed to examine the proposition of M. Emile Constant, deputy from la Gironde, to admit to promotion in the Legion of Honor the officers of the Service de Santé who have rendered exceptional service. The report is favorable to M. Constant's proposition, and concludes thus: The Chamber of Deputies invites the government to include the officers of the Service de Santé among those military men who may be decorated by the Legion of Honor for exceptional services.

Legion of Honor for President of American Red Cross

The French government has bestowed the cross of commander of the Legion of Honor on M. Davidson, president of the American Red Cross, as an evidence of the high esteem in which he is held and in recognition of the great services that the American Red Cross has rendered to the war victims in France.

Death of Dr. Tribondeau

Dr. Tribondeau, *médecin principal de la marine*, died in the naval hospital at Achilleion, Corfu, aged 46. At first professor in the Ecole de Service de Santé de la marine, then head of the laboratory of bacteriology of the fifth arrondissement maritime, he was after several months called to direct the bacteriologic service of the Hôpital de l'Achilleion. Fatigued and already ill, he was on the point of returning to France when an epidemic of influenza made its appearance among the crews of the vessels stationed at Corfu. He insisted on remaining at his post to attend the sick, without thinking of himself. He was attacked by the disease and died in ten days.

Marriages

Lieut. Earl Hick Mitchell, M. C., U. S. Navy, Indianapolis, on duty at Tampa, Fla.; to Miss Mollie Melvine Tucker of Tampa, Fla., August 22.

Luther W. Little, Nemaha, Iowa, to Miss Selma V. Olsen, of Michigamme, Mich., at Des Moines, October 12.

Silas Addison Austin, to Mrs. Naomi N. Brown, both of Los Angeles, October 23.

Deaths

Walter Franklin Chappell ✠ New York City; University of Toronto, Ont., 1879; M. R. C. S., England, 1881; aged 62; member of the American Laryngological Association, American Laryngological, Rhinological and Otological Society and American Otological Society; professor of clinical laryngology in the College of Physicians and Surgeons in the City of New York since 1910; surgeon to the Manhattan Eye, Ear and Throat Hospital, since 1887; consulting laryngologist to the Loomis Sanatorium; dropped dead in his office, October 19.

Major Frederick Oswin Waage, M. C., U. S. Army ✠ Philadelphia; on duty at Fort Bliss, Texas; University of Pennsylvania, Philadelphia, 1904; aged 41; a member of the Association of Military Surgeons of the United States; formerly chief of the medical dispensary and chief anesthetist of the Methodist Hospital, Philadelphia; who entered the National Guard of Pennsylvania in 1907, and was on duty at the base hospital, Fort Bliss, Texas; died suddenly at that post, October 31, from heart disease.

Astley Cooper Clark, Pittsburgh; University of Pittsburgh, 1891; aged 48; a member of the Medical Society of the State of Pennsylvania; local surgeon to the Baltimore and Ohio System, and for twenty years surgeon for the Pennsylvania Railroad; a member of the surgical staff of St. Francis' Hospital for twelve years, and for three years president of the Lawrence School Board; died at his home, October 20, from pneumonia following influenza.

Jane Rogers Baker ✠ West Chester, Pa.; Woman's Medical college of Pennsylvania, Philadelphia, 1892; aged 51; fellow of the American Medico-Psychological Association; who after serving in insane hospitals in Massachusetts, was given charge of the Insane Department of the Chester County Home in Embreeville, where she remained several years; originator of child welfare work in West Chester; died at her home, October 23, from typhoid fever.

John Ranly ✠ Cincinnati; Medical College of Ohio, Cincinnati, 1891; aged 42; fellow of the American Academy of Ophthalmology and Oto-Laryngology; oculist and aurist to St. Francis, Good Samaritan and St. Mary's hospitals; instructor in the eye clinic of his alma mater; and recently made a member of the faculty; died at the home of his mother in Cincinnati, October 13, from pneumonia following influenza.

Robert B. Gray, Port Carbon, Pa.; Medico-Chirurgical College of Philadelphia, 1894; aged 52; a member of the Medical Society of the State of Pennsylvania; for six years, deputy coroner of the Port Carbon, New Philadelphia and Middleport district; for ten years a member of the Board of Health of Port Carbon and Palo Alto, and for one year a member of the Port Carbon council; died at his home, October 19.

George William Booher, Berry, Ky.; University of Louisville, Ky., 1917; aged 26; a member of the Kentucky State Medical Association; one of the first physicians of Harrison County to be commissioned in the Medical Reserve Corps, but discharged by reason of physical disability in September, 1918; died at his home, October 18, from pneumonia, following influenza.

Lieut. Glenn Dewey Ransom, M. C., U. S. Army ✠ Big Rapids, Mich.; University of Michigan, Ann Arbor, 1913; aged 34; who was sent to England early in the summer of 1917, and later went to France with a hospital unit and was decorated by the French government in June, 1918, for bravery; died in France, last month, from wounds received in action.

Alexander Simpson Kelly ✠ Oakland, Calif.; Cooper Medical College, San Francisco, 1901; aged 39; professor of operative surgery in Oakland College of Medicine and Surgery; for twelve years a member of the board of education, and for three years its president; died in the Oakland Central Hospital, October 24, from pneumonia, following influenza.

William Elmo Turton, Washington, D. C.; Georgetown University, Washington, D. C., 1908; aged 35; a member of the Medical Society of the District of Columbia; also a graduate in pharmacy; a medical employee of the Health Department of the District of Columbia; died at his home, October 10, from pneumonia following influenza.

Eugene Bryce Osborn, Cleburne, Texas; University of Texas, Galveston, 1896; aged 47; local surgeon of the Missouri, Kansas and Texas Railway, and chief surgeon of the

Dallas, Cleburne and Southwestern Railway; health officer of Cleburne and Johnson County; died at his home, October 19, from pneumonia, following influenza.

Lieut. Robert Kenton McGuffin, M. C., U. S. Army ✠ Imperial, Calif.; Maryland Medical College, Baltimore, 1911; aged 33; a member of the Medical Society of the State of California; coroner of Imperial County; who was ordered to report for duty at Camp Kearney, October 23; died at his home, October 20, from pneumonia, following influenza.

William Benjamin Hardman ✠ Commerce, Ga.; College of Physicians and Surgeons in the City of New York, 1889; aged 53; once president of the Medical Association of Georgia; president of the board of trustees of Mercer University, and president of the Bank of Commerce; died at his home, October 28, from pneumonia.

Manly J. D. Dantzler, Elloree, S. C.; Medical College of the State of South Carolina, 1861; aged 78; a member of the South Carolina Medical Association, and president of the Orangeburg County Medical Society; surgeon in the Confederate Service during the Civil War; died at his home, October 12.

Thomas Best Kramer, Washington, D. C.; Howard University, Washington, D. C., 1887; aged 66; a member of the Medical Society of the District of Columbia; also a graduate in pharmacy; and at one time pharmacist in the Navy; died at his home, October 11, from pneumonia following influenza.

William Hupp Sands ✠ Fairmont, W. Va.; University of Pennsylvania, Philadelphia, 1898; aged 45; a specialist on diseases of the nose and throat; while driving in his automobile over a grade crossing near Fairmont, October 22, was struck by a Baltimore and Ohio train, and instantly killed.

Joseph James Wilson, Jr. ✠ Coldwater, Miss.; Tulane University, New Orleans, 1907; aged 32; local surgeon of the Illinois Central Railroad; who received orders to report for duty at Camp Beauregard, La., the day of his death; died at his home, October 16, from pneumonia, following influenza.

David Webster Meyer, Brooklyn; Long Island College Hospital, Brooklyn, 1894; aged 47; surgeon to the Brooklyn Eye and Ear Hospital; consulting surgeon to Samaritan Hospital, Brooklyn; ophthalmologist to the Home for Consumptives; died at his home, October 24, from pneumonia.

Asst. Surg. Rushmer Christian Christiansen, Lieut., U. S. Navy ✠ State University of Iowa, Iowa City, 1913; aged 28; who entered the Navy in July, 1917, and was on duty at Mare Island, Calif.; died in the Naval Hospital at Mare Island, October 19, from pneumonia following influenza.

Emanuel Joseph Leavitt, Brooklyn; College of Physicians and Surgeons in the City of New York, 1904; aged 41; radiologist to the Wyckoff Hospital, Brooklyn; a member of the staff of St. Mark's and the German hospitals; died at his home, October 24, from pneumonia, following influenza.

Selma Marstella Mason ✠ Clarksburg, W. Va.; George Washington University, Washington, D. C., 1900; aged 41; chief surgeon of the Mason Hospital, Clarksburg; for several years coroner of Harrison County; died in the Mason Hospital, October 21, from pneumonia, following influenza.

Capt. Jean Paul Gay, M. C., U. S. Army ✠ McAlester Okla.; University of Louisville, Ky., 1908; aged 34; in charge of the venereal disease campaign in Oklahoma, under the United States Public Health Service; died at his home, October 25, from pneumonia, following influenza.

Charles James Laffin ✠ Gallup, N. M.; New York University, New York City, 1893; aged 51; who conducted a private hospital in New York City for many years and in 1908 entered the United States Indian Service; died at his home, October 18, from pneumonia following influenza.

Thomas Sanford Dunaway Grasty, Washington, D. C.; George Washington University, Washington, D. C., 1901; aged 38; a member of the Medical Society of the District of Columbia, and a specialist in pediatrics; died at his home, October 20, from pneumonia following influenza.

Flora Estella Parker Easton ✠ Norristown, Pa.; Woman's Medical College of Pennsylvania, Philadelphia, 1901; aged 46; for eight years a member of the staff of the Norristown State Hospital for the Insane; died in that institution, October 25, from pneumonia following influenza.

James Watt Keen, Philadelphia; Medico-Chirurgical College of Philadelphia, 1897; aged 56; one of the first physicians of Philadelphia to report for emergency duty during the epidemic of influenza; died at the Emergency Hospital, Philadelphia, October 23, from influenza.

Lieut. Wendell James Phillips, M. C., U. S. Army ✠ Corvallis, Ore.; Jefferson Medical College, 1915; aged 31; for two years physician in charge of the Oregon Agricultural College, Corvallis, Ore.; died at Camp Lee, Va., October 13, from pneumonia following influenza.

Thomas Howard Irwin, Moulton, Ala.; Vanderbilt University, Nashville, Tenn., 1900; aged 41; a member of the Medical Association of the State of Alabama; chairman of the Lawrence County Board of Health; died at his home, October 17, from pneumonia following influenza.

Frederick Allen Stafford, Phoenix, Ariz.; Hahnemann Medical College, Chicago, 1895; aged 28; a member of the Arizona Medical Association, and president of the Arizona Board of Medical Examiners; died at his home, October 18, from pneumonia following influenza.

Albert Johnson Terrell, Black Mountain, N. C.; University of North Carolina, Chapel Hill, 1908; aged 42; a member of the Medical Society of the State of North Carolina; died in the Meriwether Hospital, Asheville, N. C., October 13, from pneumonia following influenza.

George Wesley Gorrill ✠ Buffalo; University of Buffalo, 1900; aged 41; American Medico-Psychological Association, and Buffalo Academy of Medicine; superintendent of the Buffalo State Hospital; died at his home, October 27, from pneumonia following influenza.

Clarence Sanford Faulkner ✠ Elizabethtown, N. Y.; College of Physicians and Surgeons in the City of New York, 1913; aged 33; a member of the Board of Health of Elizabethtown and Lewis; died at his home, October 17, from pneumonia following influenza.

Lieut. Gerard Henry Lebret, M. C., U. S. Army ✠ Montclair, N. J.; University of Maryland, Baltimore, 1913; aged 32; a member of the staff of Overbrook, the Essex County Hospital for the Insane; died at his home, October 17, from pneumonia following influenza.

Andrew Jackson Gray, Young America, Ind.; Medical College of Indiana, Indianapolis, 1897; aged 64; a member of the Indiana State Medical Association; for several terms a member of the board of commissioners of Cass County; died at his home, October 18.

William Tillman Burks, Fresno, Calif.; College of Physicians and Surgeons, San Francisco, 1900; aged 60; for some time president of the board of health of Fresno and health officer of Fresno County; also a druggist; died at his home, October 21, from pneumonia.

Charles L. Hough, Helena, Ark.; Jefferson Medical College, 1883; aged 57; also a druggist; died at his home in West Helena, October 15, from the effects of a gunshot wound of the head, self inflicted, it is believed, with suicidal intent, while despondent.

Jesse Robinson Kauffman ✠ Blue Island, Ill.; Rush Medical College, 1907; aged 34; assistant professor of surgery in Loyola University, Chicago; local surgeon to the Rock Island System; died at his home, October 28, from pneumonia, following influenza.

William Henry Robinson, Eudora, Kan.; Kansas City, Mo., Medical College, 1872; aged 70; twice mayor of Eudora; and once postmaster of Liberty Mo., and Monticello, Kan.; died in the Swedish Hospital, Kansas City, Mo., October 18, from pneumonia.

Asst. Surg. Norwin Batte Norris, Lieut. (j. g.), U. S. Navy ✠ Memphis, Tenn.; University of Tennessee, Nashville, 1917; aged 27; is reported in the *Official Bulletin* of October 14, as missing on the *U. S. S. Ticonderoga,* sunk, September 30, by a submarine.

Stanley Owen Sabel, New York City; College of Physicians and Surgeons in the City of New York, 1898; aged 42; visiting physician and a member of the medical board of Washington Heights Hospital; died suddenly at his home, October 20.

Joseph William Stone, Los Angeles; Jefferson Medical College, 1913; aged 32; a member of the Medical Society of the State of California; for several years a practitioner of Seattle; died at the home of his parents in that city, October 16.

Dean W. McKeen, Mena, Ark.; College of Physicians and Surgeons, Keokuk, Iowa, 1878; St. Louis College of physicians and Surgeon, 1888; aged 65; died in the Christian Hospital, Kansas City, Mo., October 23, after a surgical operation.

John Cassel Buckwalter, Palo Alto, Calif.; Miami Medical College, Cincinnati, 1900; aged 45; formerly of St. Louis, associate professor of otology in the Marion-Sims Beaumont College of Medicine, St. Louis; died at his home, October 13.

John Kirk Formis, Lennox, S. D.; Northwestern University Medical School, Chicago, 1909; aged 38; who enlisted in the Medical Reserve Corps, U. S. Army, June 28, 1918; died at his home, September 30, from pneumonia, following influenza.

Edward Mosher Allen ✠ Los Angeles; Rush Medical College, 1911; aged 33; assistant professor of obstetrics in the College of Physicians and Surgeons, Los Angeles; died at his home, October 21, from pneumonia, following influenza.

John George Mueller, Iowa City, Iowa; State University of Iowa, Iowa City, 1895; aged 47; for several years assistant in gynecology in his alma mater; died in a hospital in Iowa City, October 17, from pneumonia, following influenza.

Charles Elisha Collins, Rensselaer, N. Y.; Albany (N. Y.) Medical College, 1906; at one time a member of the Medical Society of the State of New York; for several terms city physician; died at his home, October 14, from heart disease.

Frank Hewitt Bartlett ✠ New York City and Yonkers, N. Y.; College of Physicians and Surgeons in the City of New York, 1888; aged 62; a specialist in diseases of the ear, nose and throat; died at his home in Yonkers, September 14.

Francis Augustus Lane ✠ Lynn, Mass.; Harvard Medical School, 1892; aged 50; formerly a member of the board of health of Lynn; for four years quarantine officer of the port of Boston; died at his home, October 29, from pneumonia.

Joseph Frank Etzbach, Chicago; State University of Iowa, Iowa City, 1905; aged 34; at one time a member of the Illinois State Medical Society; died in the La Salle (Ill.) Hospital, October 20, from pneumonia, following influenza.

Lieut. Guy Chaille Haralson, M. C., U. S. Army ✠ Vicksburg, Miss.; Loyola University, Chicago, 1917; aged 36; assistant physician at the East Mississippi Insane Asylum; died at Fort McPherson, Ga., October 24, from pneumonia.

Phillips Carey Vaughan, Chicago; Rush Medical College, 1888; Bellevue Hospital Medical College, 1889; aged 51; medical director of the Ideal Sick Benefit and Accident Association; died at his home, October 25, from pneumonia.

Richard H. Schneider, Chicago; National Medical University, Chicago, 1907; aged 57; was found dead in his apartment, November 1; death being due, it is believed, to suicide by gas asphyxiation, while suffering from melancholia.

Died in the Service
IN FRANCE
LIEUT. WILLIAM C. KANTNER, JR., M. C., U. S. ARMY, 1885-1918
(*See The Journal, last week, p. 1507*)

Frederick Waterman Cowles, West Brookfield, Mass.; Dartmouth Medical School, Hanover, 1892; aged 52; a member of the Massachusetts Medical Society; died at his home, about October 15, from bronchopneumonia.

William Williamson ✠ San Diego, Calif.; McGill University, Montreal, 1891; a specialist on diseases of the eye, ear, nose and throat; oculist to the Sante Fe System; died in Los Angeles, October 19, from pneumonia.

A. Douglas Erwin, Fidelity, Ill.; Missouri Medical College, St. Louis, 1883; while returning from a hunting trip, October 7, was shot and killed by the accidental discharge of a gun carried by one of his companions.

Frank H. Weidemann, Connellsville, Pa.; Medico-Chirurgical College of Philadelphia, 1911; aged 40; local medical examiner for the Baltimore and Ohio System; died at his home, October 24, from influenza.

Wilmer Everett Toney, Red Stone, Mont.; University of Michigan, Ann Arbor, 1911; aged 34; for two years surgeon at the Northern Pacific Railway Hospital, Missoula; died at his home, October 18, from influenza.

Warren DeWitt Ratliff, Lucedale, Miss.; Tulane University, New Orleans, 1893; aged 52; member of the Mississippi State Medical Association; died at his home, about October 24, from pneumonia, following influenza.

Charles S. Wilkirson, Roff, Okla.; Chattanooga (Tenn.) Medical College, 1899; aged 40; a member of the Oklahoma State Medical Association; died in Sherman, Texas, October 16, from pneumonia following influenza.

Lieut. Joseph Daniel Rosenthal, M. C., U. S. Army ✠ Brooklyn; New York Homeopathic Medical College, 1915; aged 27; died in the base hospital of Markleton, Pa., October 22, from pneumonia following influenza.

Lieut. Timothy Joseph Moran, M. C., U. S. Army ✠ Pittsburgh; University of Pennsylvania, Philadelphia, 1905; aged 37; a specialist in ophthalmology; died in Camp Greenleaf, Fort Oglethorpe, Ga., October 17.

James H. Reynolds, Louisa, Ky. (license, West Virginia, 1896); aged 48; a specialist in diseases of the eye, ear, nose and throat; and also a druggist; died at his home, October 9, from pneumonia following influenza.

George J. Koch ✠ Paterson, N. J.; College of Physicians and Surgeons, Baltimore, 1905; aged 38; a member of the staff of St. Joseph's Hospital, Paterson; died at his home in that city, October 19, from influenza.

Joseph White Humphrey Porter ✠ Caribou, Me.; University of Pennsylvania, Philadelphia, 1901; aged 40; a specialist on diseases of the eye, ear, nose and throat; died at his home, about October 31, from pneumonia.

Theophilus Radcliffe VanKirk, McKeesport, Pa.; Jefferson Medical College, 1864; aged 78; assistant surgeon of the Two Hundred and Ninth Pennsylvania Volunteer Infantry during the Civil War; died at his home, October 26.

Emil Henry Zimmerman, Colome, S. D., formerly of Cicero, Ill.; Loyola University, Chicago, 1913; aged 33; a member of the Illinois State Medical Society; died at his home, October 21, from pneumonia, following influenza.

Arthur Nolte ✠ New Orleans; University of Virginia, Charlottesville, 1880; College of Physicians and Surgeons in the City of New York, 1881; aged 58; died at his home, October 24, from pneumonia, following influenza.

Lieut. Holman Simpson Siff, M. C., U. S. Army ✠ Brooklyn; University and Bellevue Hospital Medical College, 1918; aged 24; an intern in Bellevue Hospital; died at his home, October 20, from pneumonia following influenza.

Thomas Eusebius Byrnes, Chicago; Loyola University, Chicago, 1918; aged 27; a member of the house staff of St. Bernard's Hospital, Chicago; died in that institution, October 10, from endocarditis following influenza.

William N. DeArmond, Fort Collins, Colo.; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1902; aged 55; a member of the Colorado State Medical Society; died at his home, October 23, from influenza.

Lee G. Betts, Prairie City, Ill.; Ensworth Medical College, St. Joseph, Mo., 1902; aged 41; a member of the Illinois State Medical Society; died at his home, October 21, from pneumonia, following influenza.

Walter John McGibbon, Chateaugay, N. Y.; Montreal School of Medicine and Surgery, 1911; McGill University, Montreal, 1913; aged 32; died at his home, October 18, from pneumonia, following influenza.

William D. Krebs, Green Bay, Wis.; Marquette University, Milwaukee, 1914; aged 31; a member of the State Medical Society of Wisconsin; died at his home, October 18, from pneumonia, following influenza.

Henry Stark, Baltimore; University of Heidelberg, Germany, 1866; aged 74; for fourteen years city vaccine physician of Baltimore; died at his home in South Baltimore, October 23, from cerebral hemorrhage.

Joseph William Walsh, Portland, Conn.; College of Physicians and Surgeons, Baltimore, 1907; aged 33; a member of the Connecticut State Medical Society; died at his home, October 20, from pneumonia.

Lieut. Homer E. Van Epps, M. C., U. S. Army ✠ Sterling, Ill.; Hahnemann Medical College, Chicago, 1916; aged 31;

died recently at Camp Mills, Long Island, N. Y., from pneumonia following influenza.

William Nelson Carter, Columbus, Ga.; University of Louisville, Ky., 1906; aged 36; a member of the Medical Association of Georgia; died in the Columbus Hospital, October 17, from influenza.

George Willard Lent, Oxford, Pa.; Jefferson Medical College, 1891; aged 57; superintendent of the Oakwood Sanatorium, Oxford; died at his home, October 18, from pneumonia, following influenza.

Francis Melville Deems, Flushing, N. Y.; Bellevue Hospital Medical College, 1868; aged 72; associate physician to the Flushing Hospital; died at the Presbyterian Hospital, New York City, October 27.

William James McKnight, Brookville, Pa.; Jefferson Medical College, 1884; aged 82; also a druggist; a practitioner since 1857; state senator in 1880; a local historian; died at his home, October 12.

Edward Isadore Schwartz, Fresno, Calif.; College of Physicians and Surgeons, Los Angeles, 1918; aged 26; an intern in the Fresno County Hospital; died in that institution, October 21, from influenza.

Lieut. Robert Archie Sherwood, M. C., U. S. Army ✠ University of Oregon, Portland, 1916; Army Medical School, Washington, D. C., 1918; aged 28; is reported to have died in action in France, September 17.

Lieut. Carl Bibb Hudson, M. C., U. S. Army ✠ Montgomery, Ala.; Harvard Medical School, 1917; aged 30; died, October 2, a few days after his arrival in France, from pneumonia following influenza.

William P. Harvey, San Francisco; University of California, San Francisco, 1900; aged 43; a member of the Medical Society of the State of California; died at his home, October 27, from influenza.

J. Sanderson Lazarus, Bloomsburg, Pa.; Jefferson Medical College, 1868; aged 76; a member of the Medical Society of the State of Pennsylvania; died at his home, October 19, from heart disease.

Lewis Webster Burdick ✠ Maryland, N. Y.; Albany (N. Y.) Medical College, 1909; aged 36; died in the Fox Memorial Hospital, Oneonta, N. Y., October 21, from pneumonia, following influenza.

Bradford Augustus Richards ✠ Rochester N. Y.; McGill University, Montreal, 1901; aged 41; a specialist in diseases of the ear, nose and throat; died at his home, October 22, from pneumonia.

Died in the Service
IN FRANCE
LIEUT. ROBERT A. SHERWOOD, M. C.,
U. S. ARMY, 1890-1918

George W. Mullins, Milano, Texas; Kentucky School of Medicine, Louisville; at one time a member of the State Medical Association of Texas; died at his home, October 20, from pneumonia.

John Stanley Scott, Lake Charles, La.; Tulane University, New Orleans, 1912; aged 30; a member of the Louisiana State Medical Association; died at his home, October 17, from pneumonia.

Clinton Lee Hyatt, Kissimmee, Fla.; North Carolina Medical College, Charlotte, 1908; aged 37; a member of the Florida Medical Association; died at his home, October 17, from pneumonia.

Lieut. Chester Cameron Wood, P. A. Surg., U. S. Navy ✠ on duty on *U. S. S. Alabama;* Jefferson Medical College, 1910; aged 30; who entered the Navy, May 4, 1915; died at sea, October 5.

Thomas B. Slaton, Greenville, Ky.; Barnes Medical College, St. Louis, 1902; aged 39; a member of the Kentucky State Medical Association; died at his home, October 20, from influenza.

Lieut. Edward Kenneth Lubin, M. C., U. S. Army ✠ New York City; University and Bellevue Hospital Medical College, 1918; aged 24; died in Bellevue Hospital, October 27, from influenza.

Lieut. Ralph Waldo Turner, M. C., U. S. Army ✠ Albany, N. Y.; Albany Medical College, 1917; aged 24; on duty at Fort Oglethorpe, Ga.; died at that post, October 17, from pneumonia.

True S. Burgess, Washington, D. C., formerly of Russellville, Ark.; George Washington University, Washington, D. C., 1912; aged 31; died at the home of his mother, October 22.

Walter Scott Muirhead, Floodwood, Minn.; University of Illinois, Chicago, 1909; aged 33; was burned to death, about October 13, in the forest fires which prevailed in northern Minnesota.

Foss Edwin Pratt, Ruston, Tacoma, Wash.; Cleveland College of Physicians and Surgeons, 1904; at one time mayor of Ruston; died in a hospital, in Tacoma, October 20, from pneumonia.

Lieut. Frank Benedict Rosinski, M. C., U. S. Army ✠ Cleveland; aged 27; who had just been ordered to Fort Oglethorpe, Ga., for duty; died at his home, October 21, from influenza.

John Joseph O'Donnell, Boston; Harvard Medical School, 1915; aged 33; who had been in Los Angeles since January, died at that place in October from pneumonia following influenza.

William Meredith Gregory, Berea, Ohio; Cleveland Medical College, 1895; Cleveland College of Physicians and Surgeons, 1899; aged 61; died at his home, October 9, from influenza.

Lafayette Bennett, Elkton, Ky.; University of Tennessee, Nashville, 1900; aged 41; a member of the Kentucky State Medical Association; died at his home, October 20, from influenza.

Henry S. Lindley, Wilkinsburg, Pa.; Jefferson Medical College, 1866; aged 80; surgeon in the federal service during the Civil War; died at his home, October 10, from heart disease.

Charles Francis Montgomery ✠ Roswell, N. M.; University of Missouri, Columbia, 1905; aged 39; died in St. Mary's Hospital, Roswell, about October 15, from influenza.

Horace David Hermany, Mohoney City, Pa.; Jefferson Medical College, 1892; aged 53; also a druggist; died at his home, October 21, from pneumonia following influenza.

Salamet Isa Aranki, Bridgeport, Conn.; College of Physicians and Surgeons, Baltimore, 1914; aged 32; a native of Jerusalem; died at his home, October 7, from influenza.

Lieut. Benjamin Franklin McArthur, M. C., U. S. Army ✠ Lizelia, Miss.; Memphis (Tenn.) Hospital Medical College, 1905; aged 35; died at his home, October 20, from influenza.

Charles O. Zahner, Louisville, Ky.; University of Louisville, Ky., 1904; aged 38; professor of physiology in his alma mater; died at his home, October 11, from influenza.

Maude Leontine Morrison, Los Angeles; College of Physicians and Surgeons, Los Angeles, 1917; aged 33; an intern in the Los Angeles County Hospital; died recently.

Wyatt Patrick Exum, Jr., Maxton, N. C.; Medical College of Virginia, Richmond, 1901; aged 43; died at his home, October 16, from pneumonia, following influenza.

Francis Graham Gardiner ✠ Pittsburgh; University of Michigan, Ann Arbor, 1880; aged 68; died in the Passavant Hospital, Pittsburgh, October 22, from pneumonia.

George Davis Warren ✠ Ozark, Ark.; University of Arkansas, Little Rock, 1911; aged 34; died at his home, October 19, from pneumonia following influenza.

Lieut. Herman Warner Krantz, M. C., U. S. Army ✠ Union Bridge, Md.; University of Maryland, Baltimore, 1915; aged 27; died at his home, October 25, from influenza.

Harvey Marshall Vance ✠ Pleasant Grove, Utah; University of Illinois, Chicago, 1903; aged 40; died at his home, October 16, from pneumonia following influenza.

William Augustus Keeley, Brooklyn; New York University, New York City, 1888; aged 51; died at his home, October 20, from pneumonia following influenza

Samuel Duffie Austin, Handsboro, Miss.; George Washington University, Washington, D. C., 1905; aged 42; died at his home, about October 25, from influenza.

Alfred Hincks Youngs ✠ Pierre, S. D.; University of Minnesota, Minneapolis, 1907; aged 40; died at his home, October 16, from pneumonia, following influenza.

W. Lugene Seeger, Dallas, Texas; Baylor University, Dallas, 1913; aged 29; died at the Waxahachie (Texas) Sanitarium, about October 23, from pneumonia.

Clarence Wesley Batchelet ✠ Pine River, Wis.; Milwaukee Medical College, 1912; aged 29; died at his home, October 21, from pneumonia, following influenza.

Alfred Friedman, New York City; College of Physicians and Surgeons in the City of New York, 1876; aged 67; died at his home, October 18, from pneumonia.

Kenneth Field Albee ✠ Weston, Mass.; Harvard Medical School, 1914; aged 32; died at his home, September 23, from bronchial pneumonia following influenza.

Ralph Jiles Smirl, New Raymer, Colo.; Vanderbilt Medical College, 1915; aged 28; died in the Park Avenue Hospital, Denver, October 18, from influenza.

John C. McClenathan, Connellsville, Pa.; Jefferson Medical College, 1881; aged 66; formerly surgeon to the Cottage State Hospital; died at his home, October 26.

Andrew Donaldson, Kansas City, Mo.; University of Wooster, Cleveland, Ohio, 1874; aged 79; died at his home, October 5, from cerebral hemorrhage.

Stephen Finley Welton, Montezuma, Ga.; Meharry Medical College, Nashville, Tenn., 1909; aged 40; a colored practitioner; died at his home, October 7.

Merlin B. Wyatt ✠ Manning, Iowa; University of Nebraska, Omaha, 1907; aged 35; roentgenologist; died at his home, October 22, from influenza.

Lorenzo R. Thornton, Filley, Neb. (License, Nebraska, 1891); aged 84; a veteran of the Civil War; died in the Soldiers' Home, Milford, October 17.

Giuseppe Vittorio Sbordone, New York City; University of Naples, Italy, 1889; aged 56; died at his home, October 21, from pneumonia following influenza.

Vincent Jastremski, Montegut, La.; Tulane University, New Orleans, 1897; aged 40; died at his home, October 19, from pneumonia, following influenza.

Curtis E. Bowers, Kersey, Colo.; Hahnemann Medical College, Chicago, 1902; aged 40; died at his home, October 22, from pneumonia following influenza.

Edward Charles Cekul ✠ La Otto, Ind.; Indiana University, Indianapolis, 1914; aged 33; died at his home, October 24, from pneumonia, following influenza.

Kieran Joseph O'Neill, Coupeville, Wash.; University of Toronto, Ont., 1909; aged 30; died at his home, October 23, from pneumonia, following influenza.

Robert Lenard, Chicago; Illinois Medical College, Chicago, 1900; aged 44; died at South Chicago Hospital, October 27, from pneumonia, following influenza.

Francois DeSales Dube ✠ Milwaukee; Milwaukee Medical College, 1908; aged 32; died at Amery, Wis., October 23, from pneumonia, following influenza.

Lawrence Dutcher Gillick, Pulaski, Wis.; Milwaukee Medical College, 1909; aged 32; died at his home, October 16, from pneumonia, following influenza.

Paul Henry Hesse, London Mills, Ill.; Chicago College of Medicine and Surgery, 1908; aged 45; died at the Red Cross Hospital, Kankakee, Ill., October 16.

Clyde Switzer Horton, Edgerton, Wis.; University of Illinois, Chicago, 1907; aged 38; died at his home, October 5, from pneumonia following influenza.

William G. Gardiner, Atlantic City, N. J.; Hahnemann Medical College, Philadelphia, 1888; aged 50; died at his home, October 17, from influenza.

Frederick Lovell Bogue ✠ New York City and Mont Clair, N. J.; University of Pennsylvania, Philadelphia, 1895; aged 48; died at his home, October 26.

Lieut. Eugene Fellner Hull, M. C., U. S. Army ✠ Berlin, N. Y.; Albany (N. Y.) Medical College, 1913; aged 30; died in Little Rock, Ark., October 18.

Charles J. Reimer, Jr. ✠ Phoenixville, Pa.; Jefferson Medical College, 1911; aged 32; died at his home, October 13.

Edward John Miller, Urbana, Ill.; University of Illinois, Chicago, 1912; aged 30; died at his home, October 15, from pneumonia, following influenza.

Robert Henry Scott, Laingsburg, Mich.; Detroit College of Medicine and Surgery, 1894; aged 59; died at his home, October 15, from pneumonia.

Silas Baldwin Jacobs, Baltimore; Southern Homeopathic Medical College, Baltimore, 1905; aged 35; died at his home, October 17, from influenza.

Margaret E. Pomeroy, Salem, Ore.; Willamette University, Salem, 1904; died in Portland, Ore., October 23, from pneumonia, following influenza.

Joseph Emil Artiges ✠ San Francisco; Cooper Medical College, San Francisco, 1887; aged 55; died at his home, October 22, from influenza.

Carl Logan Brown ✠ Cawker City, Kan.; Kansas Medical College, Topeka, 1913; aged 33; died in Bennington, Kan., October 9, from influenza.

Lieut. Wilburn Edgar Hampton, M. C., U. S. Army ✠ Ferris, Texas; University of Louisville, Ky., 1910; aged 31; died in Dallas, October 21.

Joseph A. S. Regli, San Jose, Calif.; Georgetown University, Washington, D. C., 1902; aged 42; died at his home, October 24, from influenza.

Alfred F. Skillman, McCracken, Kan.; Northwestern Medical College, St. Joseph, Mo., 1885; aged 61; died at his home, recently, from pneumonia.

John Marye Lewis ✠ Manassas, Va.; University of Virginia, Charlottesville, 1905; aged 37; died at his home, October 14, from pneumonia.

George Ulrich Panzer, Truman, Minn.; Eclectic Medical Institute, Cincinnati, 1910; aged 37; died at his home, October 23, from influenza.

Ella Florence Preston, Dansville, N. Y.; Eclectic Medical College of the City of New York, 1882; aged 70; died at her home, October 15.

George Greer, Vandalia, Ill.; Missouri Medical College, St. Louis, 1882; aged 67; died at his home, October 17, from cerebral hemorrhage.

Edward Humble Moss, Cincinnati; Medical College of Ohio, Cincinnati, 1900; aged 43; died at his home, October 22, from pneumonia.

John H. Norman, Blanchester, Ohio; Eclectic Medical Institute, Cincinnati, 1875; aged 66; died at his home, October 22, from pneumonia.

Florence Josephine Chubb, San Francisco; University of California, San Francisco, 1918; died at her home, October 28, from influenza.

Paul Willis Brown ✠ Springfield, Ohio; Barnes Medical College, St. Louis, 1899; aged 47; died at his home, October 14, from influenza.

Benjamin F. Beane, West Manchester, Ohio; Eclectic Medical Institute, Cincinnati, 1881; aged 67; died at his home, October 19.

William Jesse Bedell, New York City; Bellevue Hospital Medical College, 1898; aged 48; died at his home, October 23, from pneumonia.

John Eugene Goldstein, Brooklyn; Fordham University, New York City, 1916; aged 25; died at his home, October 18, from pneumonia.

John Henry Burkartmaier ✠ Avondale, Pa.; Jefferson Medical College, 1911; aged 35; died at his home, October 18, from influenza.

Karl August Bieber ✠ Tipton, Kan.; Kansas Medical College, Topeka, 1909; aged 34; died at his home, October 14, from influenza.

John J. Gambill, Martha, Ky.; Louisville (Ky.) Medical College, 1886; aged 75; died at his home, October 10, from heart disease.

Martin A. Montgomery ✠ Owensville, Ind.; University of Louisville, Ky., 1898; aged 43; died at his home, about October 20.

Darvin S. Gailey ✠ Ashland, Ill.; University of Illinois, Chicago, 1897; aged 42; died at his home, October 20, from septicemia.

Carl William Lutz, Ottawa, Ill.; University of Illinois, Chicago, 1915; aged 31; died at his home, October 19, from pneumonia.

Eugene Judy Primm ✠ Chatham, Ill.; Barnes Medical College, St. Louis, 1910; aged 36; died, recently, from pneumonia.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

MORE MISBRANDED NOSTRUMS

Baker's Tubercular Remedy.—Edward D. Morgan, who had been treasurer and general manager of the W. H. Baker Co. of Cleveland, Ohio, was charged with misbranding a product called "Dr. W. H. Baker's Tubercular Remedy." The stuff contained 11 per cent. alcohol by volume, sugars, potassium iodid, ammonium chlorid, glycerin, licorice, plant extractives, etc. The claim that the product was a remedy and cure for tuberculosis was declared false and fraudulent, and Morgan was fined $25 and costs.—[*Notice of Judgment No. 4998.*]

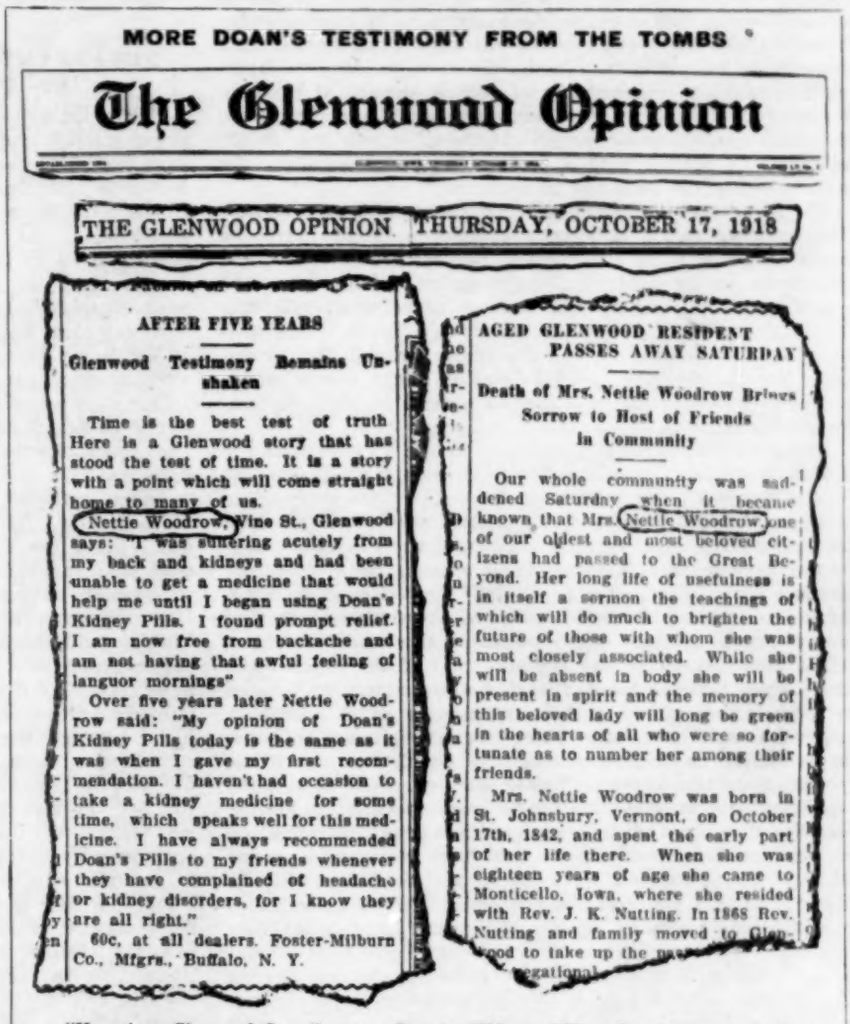
Lee's Save the Baby Croup Specific.—Charles Samuel Ulcher and Carrie L. Ulcher, who traded as Wm. W. Lee & Co., Troy, N. Y., were charged with misbranding this preparation. According to the government chemists, the product was a liniment with a fatty oil base, and containing camphor, rosemary and thyme. The claim that it was a specific for croup and for saving the lives of babies affected with that disease was declared false and fraudulent.

The same individuals were also charged with misbranding "Lee's Croup Mixture." which the government chemists reported contained over 70 per cent. of lard, about 7 per cent. alcohol, and more than 18 per cent. volatile oils, consisting of a mixture of oils of rosemary and thyme and camphor. This also was falsely and fraudulently represented to be a remedy for croup. The two Ulchers were fined $25.—[*Notice of Judgment No. 4999.*]

Twentieth Century.—This preparation was marketed by one Eva J. Powell of Findlay, Ohio, who traded under the name of the Twentieth Century Remedy Co. It consisted of a powder and a solution, the latter, according to the government chemists, being, essentially, a mixture of water, glycerin, lead and zinc sulphates, acetates, nitrates, and a small quantity of perfume. It was falsely and fraudulently represented to be a cure and preventive of gonorrhea and gleet. Eva J. Powell was convicted of misbranding and ordered to pay the costs of the proceedings.—[*Notice of Judgment No. 4982.*]

Matthai's Victory.—Margarete E. Matthai of Baltimore, who did business as "Professor C. E. Matthai," sold a nostrum called, "Professor C. E. Matthai's Victory." The stuff contained 49 per cent. alcohol, 1.2 grains of opium to the fluidounce, and 3.5 per cent. camphor and volatile oil, and small amounts of red pepper. It was sold under claims that it was a remedy for diphtheria, cholera, rheumatism, scarlet fever, yellow fever, epilepsy, inflammation of the kidneys and bladder, diabetes and several other conditions. These claims the government declared were false and fraudulent. It was further misbranded in that the amounts of alcohol and opium declared on the label were less than the quantities actually present. The defendant was fined $100 and costs.—[*Notice of Judgment No. 4983.*]

MORE DOAN'S TESTIMONY FROM THE TOMBS



The Glenwood Opinion

THE GLENWOOD OPINION THURSDAY, OCTOBER 17, 1918

AFTER FIVE YEARS

Glenwood Testimony Remains Unshaken

Time is the best test of truth Here is a Glenwood story that has stood the test of time. It is a story with a point which will come straight home to many of us.

Nettie Woodrow, Vine St., Glenwood says: "I was suffering acutely from my back and kidneys and had been unable to get a medicine that would help me until I began using Doan's Kidney Pills. I found prompt relief. I am now free from backache and am not having that awful feeling of languor mornings"

Over five years later Nettie Woodrow said: "My opinion of Doan's Kidney Pills today is the same as it was when I gave my first recommendation. I haven't had occasion to take a kidney medicine for some time, which speaks well for this medicine. I have always recommended Doan's Pills to my friends whenever they have complained of headache or kidney disorders, for I know they are all right."

60c, at all dealers. Foster-Milburn Co., Mfgrs., Buffalo, N. Y.

AGED GLENWOOD RESIDENT PASSES AWAY SATURDAY

Death of Mrs. Nettie Woodrow Brings Sorrow to Host of Friends in Community

Our whole community was saddened Saturday when it became known that Mrs. Nettie Woodrow, one of our oldest and most beloved citizens had passed to the Great Beyond. Her long life of usefulness is in itself a sermon the teachings of which will do much to brighten the future of those with whom she was most closely associated. While she will be absent in body she will be present in spirit and the memory of this beloved lady will long be green in the hearts of all who were so fortunate as to number her among their friends.

Mrs. Nettie Woodrow was born in St. Johnsbury, Vermont, on October 17th, 1842, and spent the early part of her life there. When she was eighteen years of age she came to Monticello, Iowa, where she resided with Rev. J. K. Nutting. In 1868 Rev. Nutting and family moved to Glenwood to take up the pas- [illegible] regational

"Here is a Glenwood Story" says a Doan's Kidney Pills advertisement, "with a point which will come straight home to many of us." How true! The advertisement appeared in the Glenwood (Ia.) *Opinion* of Oct. 17, 1918, relative to Nettie Woodrow's use of Doan's Kidney Pills. On another page of the same issue was an obituary notice of Nettie Woodrow. As the Doan's advertisement sagely remarks: "Time is the best test of truth." THE JOURNAL has, at various times, published unfortunate coincidences similar to the one above. Doubtless it could publish more, did the Doan's concern not instruct newspapers which carry its advertising to return advertising "copy" containing testimonials of local people who have died!

Moreau's Soothing Wine of Anise.—The Lafayette Co. of Berlin, N. H., shipped this product, which the government declared was being sold under false and fraudulent claims. The "soothing wine for children," according to the federal chemists, was a syrup containing morphin acetate and alcohol, and flavored with anise. It was falsely and fraudulently represented to be a remedy for diarrhea, dysentery, indigestion and vomiting of children. Furthermore, the package bore no statement regarding the quantity or proportion of morphin and alcohol. The company first pleaded not guilty, but later withdrew this plea and entered a plea of guilty; it was fined $25 and costs.—[*Notice of Judgment No. 4989.*]

Sensapersa.—This product was marketed by one Stephen Britton of New York City, who did business as the Brown Export Co. "Sensapersa," according to the government chemists, consisted of purple colored tablets containing asafetida, cannabis indica, and a drug containing a mydriatic alkaloid such as hyoscyamus. It was falsely and fraudulently represented to be a cure for "nervous trouble" and a remedy for neurasthenia, nervous prostration, nervous debility, etc. Britton was fined $50.—[*Notice of Judgment No. 4984.*]

Correspondence

VALUE OF VACCINATION AGAINST INFLUENZA

To the Editor:—I cannot resist the impulse to reply to your editorial on "Serums and Vaccines in Influenza" (The Journal, Oct. 26, 1918, p. 1408). The medical profession, quite justly proud of its conservatism, is sometimes guilty of carrying it to extremes. We rarely seem to be willing to take an assumption at its face value.

Your editorial begins by saying that "we have as yet no specific serum or other specific means for the cure of influenza." Quite true; but our present knowledge of two most important biologic laws, namely, the extraordinary variation under changing environments of certain species of bacteria, together with the even more marked morphologic changes in the same species under various abnormal conditions, should allow us to predict with a certain degree of accuracy the results of a given series of procedures.

The identity of the influenza bacillus may fairly be assumed. The evidence seems sufficiently complete. It may never be more complete than it is at the present time. The same objections to its identity from negative evidence may be equally well applied to the pneumococcus, the diphtheria bacillus, and to the bacillus of typhoid fever. You will recollect that Remlinger and Schneider pointed out, as did Chantemesse, that the typhoid bacillus might live a saprophytic existence in the intestines of normal persons, particularly after attack.

The tremendous present increase in the virulence of the influenza bacillus is easily understood when one considers its incidence among the armies of the field. The stepping-up process, or what Besson calls "exalted virulence," was the inevitable result of its spreading among densely massed troops in the first place. Thus, our first reports came from the German army over a year and a half ago. Hence the virulence has intensified itself all out of proportion to that of normal times. If these micro-organisms can reproduce themselves about every twenty minutes, and if they follow the well-known biologic laws of variation, as commonly applied to animals and plants, a sufficient number of thousands of generations will have elapsed since the last influenza epidemic to permit the production of a wholly distinct variety, if not species, from the former influenza bacillus. Add to this the rapid tendency toward variation so prone to take place in the opposite direction when organisms are long cultivated on artificial culture mediums, as has been the case in many laboratories throughout the country, and it will readily be appreciated that the recognized "standard" influenza vaccines would be potent only by the merest chance. In all probability they would be worse than useless but—and here is the crucial point—influenza organisms isolated from the blood or organs of a patient suffering from this particular present virulent epidemic and grown in the laboratory under conditions such as to keep this virulence at its highest possible potency ought, for a few weeks or months before they again undergo botanic (and chemical) variation, to be capable of conferring a high degree of immunity at this time and for this epidemic. It seems evident, therefore, that most influenza vaccines mean nothing—probably worse than nothing. In this I agree with you. Also to hold out the hope to patients that they are protected by these vaccines is a mistake, of course; but any particular vaccine, such as that recently prepared by the New York Department of Health under Dr. Park, or the United States Hygienic Laboratory under Dr. McCoy, for this particular epidemic, and used now while freshly isolated and highly potent, ought to be accepted at its face value. In behalf of myself and my own family, I feel a very great personal debt of gratitude toward the New York Health Department and especially toward Dr. Krumwiede, for his kindness in supplying me with this particular vaccine at the earliest possible moment. The physician who takes this vaccine or that vaccine himself and gives it to his family has the privilege of stating such fact to his patients, and this ought to be quite enough of a statement to make to people of intelligence. Of course, we cannot tell who might have become afflicted without the vaccine except from ultimate statistics; but the assumption that the right vaccine (freshly isolated from a case during a given epidemic) used at the right time (shortly after its isolation) and in sufficient doses (large enough to produce at least three well-marked local and constitutional reactions) should be accepted at its face value as sufficient to confer a short-time immunity to cover the duration of a given epidemic, and some of us feel perfectly willing to let the vaccine speak for itself.

Benjamin S. Paschall, M.D., New York.

[Comment.—See "Value of Vaccination Against Influenza," Current Comment, this issue, page 1583.—Ed.]

TREATMENT OF INFLUENZAL PNEUMONIA BY CITRATED TRANSFUSIONS

To the Editor:—In The Journal, October 19, we read with great interest the article on the "Treatment of Influenza-Pneumonia by the Use of Convalescent Human Serum" by McGuire and Redden of the United States Navy Medical Corps. We have done two citrated transfusions, using the whole blood, the first one, October 15. The effect clinically corresponded to that reported in the article mentioned, but the effect of the transfusion on the white blood cells was what especially attracted our attention, as our average count in fifteen cases had been 9,200, the lowest 4,900 and the highest 16,300, being in marked contrast to usual pneumococcic or streptococcic pneumonia.

One case was that of a woman, aged 23, as near as determined in her third day of pneumonia, and also between six and seven months pregnant. Her temperature on the two previous days had ranged from 102 to 104, and at the time of the transfusion at 6 p. m., the temperature was 102.5 and the pulse 136. The pulse had been between 134 and 140 all day. Sixty c.c. of whole blood were taken from a young man who had been three days normal, following influenza-pneumonia, citrated, and given intravenously. Five hours later, the temperature had gone to 103, and the pulse was 130. Four hours later, the temperature was 101 and by the following morning at 11:45, the temperature was 100, and the pulse 114. By 8 p. m. the temperature was 101.2 and the pulse 126, at which time the patient received 30 c.c. of whole blood citrated from her husband, who was also two days convalescent from influenza, without pneumonia. This was followed in four hours by a rise in temperature to 103, pulse 130, but she was at that time having severe labor pains and was delivered of a living child six hours later. The temperature was never above 101.6 following the second transfusion, and she continued to recovery by lysis. Six hours before the first transfusion, with temperature 103, pulse 140, the leukocyte count was 6,800. The morning following the first transfusion, the leukocytes had risen to 11,250. Ten hours after the second transfusion, the leukocyte count had risen to 24,100. Of course, between the last transfusion and count, delivery had taken place, though with very little loss of blood. Twenty-four hours later, the leukocyte count was 23,200, and twenty-four hours later still, 21,150. At the end of the following twenty-four hours, or on the 20th, at which time the patient's temperature was remaining normal, the leukocyte count was 18,900.

The other case was that of a man, aged 28, in the third day of clinical influenzal pneumonia, following a three day attack of influenza. The temperature at the time of transfusion was 103.4, and the pulse 128. Sixty c.c. of citrated blood were used at 9 p. m., and at 1 a. m. the temperature was 102, and the pulse 100. The pulse again reached 102 only once. There was a continual decline of both temperature and pulse until October 21, at which time the temperature was 100 and the pulse 98. The leukocyte count on the 17th at 10 a. m., the day of the first transfusion, was 10,500. On the following morning, with a temperature of 101, the leukocyte count was 14,800. Twenty-four hours later, with a temperature of 100.8, the leukocyte count was 12,600. On the morning of the 20th, the temperature was 100.3, and the leukocyte count 10,100.

Both of these cases were distinct influenzal pneumonia, with definite consolidation, excessive cough, nausea and continuous

vomiting, more than rusty sputum, a moderate degree of cyanosis, pinched expression and great exhaustion. The transfusions were both followed by a fall of temperature and pulse and increase of leukocyte count. In the case in which the two transfusions were given there was an increase after each transfusion. The whole blood was used, because of the possibility of the value of corpuscles as containing the antibodies. The blood of the donor and the recipient were both tested in each case for iso-agglutination. A Wassermann test was not made on the husband, but was on the other donors.

W. L. BROWN, M.D., and
B. L. SWEET, M.D., El Paso, Texas.

ALKALIS IN THE TREATMENT OF INFLUENZA

To the Editor:—Following my recent letter regarding the alkaline treatment of influenza (THE JOURNAL, Oct. 26, 1918, p. 1431), I have had repeated inquiries as to the exact technic and details of the treatment. The term "alkaline saturation" seemed too indefinite.

When the recent epidemic appeared in Philadelphia, I was studying acidosis in a diabetic patient, using the Marriott apparatus. With acidosis as the admitted cause of death in these influenzal cases, I treated every patient on this theory. I have thought of acidosis first, foremost and always—before the attack if there was a suspicion of the disease, during the attack, and until complete recovery. All other treatment has been secondary to that directed to the acidosis.

At the outset and through the attack I have given every patient the three well-known alkalis with which we all combat acidosis—sodium bicarbonate, potassium citrate and the calcium salts in the form of lime water. To every patient is administered a teaspoonful of sodium bicarbonate to a pint of luke warm water every four hours by enema.

In my routine treatment I have given this simple prescription to spare the overworked druggists:

Sodium bicarbonate	½ ounce
Peppermint water	4 ounces

Teaspoonful every two hours.

Alternating with:

Potassium citrate	½ ounce
Peppermint water	4 ounces

Teaspoonful every two hours.

The calcium salts I have given in the form of lime water, one third, and milk, two thirds. Some patients with fulminant attacks of vomiting and terrific headaches could not tolerate the potassium salts, and to such I have given only the sodium bicarbonate mixture every hour and the soda enema as above. It is surprising even in severe cases how the soda in from twenty-four to forty-eight hours will relieve the early pains.

In addition to the eighteen cases of pneumonia with crises already reported, I have had three more, and no deaths, except in a lad with congenital heart disease. In another case of pneumonia, a woman pregnant three months, though very ill, is recovering. I have seen in this whole epidemic at least a hundred patients with consolidated spots (lobular pneumonia). In fact, the spots of consolidation elicited by percussion with the whole hand and verified by accurate palpation and auscultation have been so frequent, and often found late in the attack, that this epidemic seems one of pneumonia rather than of influenza. However, in many severe cases I detected no physical signs other than râles, although it must be admitted that my examinations were necessarily hasty.

I have seen few large bubbling râles, such as many describe.

I have, in addition, employed the common heart and respiratory stimulants—strychnin, caffein, spartein, digitalis, camphorated oil, atropin, oxygen, aromatic spirit of ammonia, etc., but I do not believe that all these patients so near death could have recovered in an epidemic so fatal as that in Philadelphia without the basic treatment by the alkalis on the acidosis theory.

THOMAS C. ELY, M.D., Philadelphia.

To the Editor:—The note in THE JOURNAL, October 26, by Dr. T. C. Ely on the treatment of influenza is timely, as the present generation has been prone to rely on the coal tar derivatives and acetylsalicylic acid: remedies more comforting than curative in this disease. The use of alkalis in "colds" is probably as old as the pyramids, and is the common method employed by at least the older medical men. They prescribed liquor ammonii acetatis if there were bronchial or tracheal symptoms, and potassium citrate under other circumstances. The potash salts are perhaps more effective in such troubles than the soda salts.

Dr. Ely is right, I think, in emphasizing the necessity of administering alkalis. The influenza bacillus, like most others, does not flourish in an alkaline medium, and taking advantage of this circumstance I have been advocating the administration of sodium bicarbonate as a preventive in doses of 60 grains a day. From experience gathered in previous epidemics I think it undoubtedly is effective for this purpose. I also know that it does not always succeed, owing partly to the impossibility of rendering the urine alkaline with soda alone.

In severe cases few remedies are equal to sodium bicarbonate administered intrarectally by the drip method with the addition of glucose or, better still, sucrose. The immunity enjoyed by the very young and the old is probably wholly due to the secretions being usually alkaline on account of the character of their diet.

ANSTRUTHER DAVIDSON, M.D., Los Angeles.

"ATTITUDE OF CHRISTIAN SCIENTISTS IN THE PRESENT EPIDEMIC OF INFLUENZA"

To the Editor:—In quoting from an incomplete and incorrect report of an announcement in which Christian scientists were urged by the Christian science board of directors to help their country meet the epidemic situation, a physician's letter in your issue of October 19 is misleading. By implication this writer seeks to give the mistaken impression that Christian scientists do not observe the regulations of the health authorities.

Christian scientists are widely known to be law abiding citizens. They are taught not to disregard the differing views of others, and to observe the orders of duly constituted authority relating to quarantine and contagion. The churches in Boston were not ordered closed by health authorities—merely requested—and in maintaining its services the mother church was in accord with the view of our Chicago health authorities who held that church services were deemed necessary to the maintenance of the public morale.

WALTER H. VAN ZWOLL, Chicago.
Christian Science Committee on Publication.

AN IMPROVED PLUGGED STETHOSCOPE FOR THE DETECTION OF MALINGERING

To the Editor:—Instead of plugging the ear-piece of the stethoscope with wax or cotton, a three-way valve, such as is used for bladder irrigation, is connected with the tubing leading to the ear-pieces and the chest-piece.

This enables the examiner to switch the sound into either ear, or to exclude it altogether without removing the stethoscope from the registrant's ears and without his knowledge of what is being done. Some of the registrants have been coached, and naturally assume, if the apparatus is removed from the ears and then replaced, that it has been changed, and govern their replies accordingly.

With this appliance, malingering can be readily detected, especially if it is used with the registrant's back toward the examiner. The small valve tip is connected with the bell, and it may be necessary to wind this with one or two turns of adhesive plaster to make it fit the stethoscope tubing. The other two tips are larger and fit the ear-piece tubing perfectly. On the top of the valve stem is a small arrow; this should be disregarded, as it indicates the direction of flow when used for irrigation.

When the valve lever is in line with the right hand tube, the sound enters the left ear, and vice versa. In other words, the sound is excluded from the side corresponding to the long axis of the lever. A midway position excludes from both ears. The valves work rather stiffly at first and the screw should be loosened and oiled if necessary. For voice tests the ordinary stethoscope bell may be used, or a small funnel may be substituted if the bell is too small.

For testing with tuning forks, the chest-piece with a hard rubber diaphragm has proved most satisfactory, and transmits the sound very well. Only the lower pitched forks (128 and 256) should be used, since it is difficult to exclude forks of higher pitch. If necessary to use these or the conversational voice, a long tube (6 or 8 feet) may be connected with the apparatus. At this distance the ear-pieces will prevent the entrance of the sound except through the channels desired. The three-way valves are very inexpensive and may be obtained from any supply house.

JOHN LESHURE, M.D., New York.

PROMOTION WITH LOSS OF INCOME

To the Editor:—In your information to prospective medical officers regarding pay, commutation of quarters for dependents, etc., there is one contingency, one throw of the dice, that may knock out these calculations.

I entered the service sixteen months ago. I am 45 years old and have a wife and five children. I was at San Francisco and Camp Fremont as a first lieutenant up to last month. Since April 15 I have been allowed commutation for my family in the state of Washington, which brought my check up to $203.28 a month.

I was sent to the Canal Zone and found on arrival I was a captain. I also found that there are quarters "to burn" at all the camps here. It will take between $400 and $500 to move my family down here any way I figure it, as they would have to come to New Orleans, 3,300 miles by railway, to meet a transport and probably have to wait a week or more in that city. The Pacific Mail charges $135 a ticket from San Francisco, and it would require three tickets, and there would be about $75 additional from Washington to San Francisco. I find myself in a big castle of a house all alone and a monthly check of $200 as a captain instead of my $203.28 as first lieutenant. No assurance can be had as to how long I shall be left here, so you can see that after we have all existed fourteen months on a lieutenant's pay I cannot take the chance of paying out so much money to transport my family here and possibly in a short time have to take them back. Besides, we own our home, which would probably stand idle.

So this proposition is a kind of a joke on me. But I am not kicking or complaining—only hoping the war will soon be over and that I can go home.

If you should find any reason for publishing any of this, please omit my name and city.

K. O. P.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

DIRT AND CARBON REMOVER

For cleaning the hands after machine work and the skin locally for hypodermic medication, and for removing carbon from the cylinders of automobiles, I use a mixture of:

Denatured alcohol.
Volatile oil of turpentine (ordinary turpentine) of each.....2 ounces
Ether ..... 3 drams

Mix turpentine and alcohol, shake and add the ether.

From one half to one ounce is put in the cooled cylinders of the automobile and allowed to stand two or more hours. The mixture fires quickly and blows out the carbon with a good speed.

F. U. FERGUSON, M.D., Gallitzin, Pa.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ARKANSAS: Little Rock, Nov. 12-13. Sec., Regular Bd., Dr. T. J. Stout, Brinkley, Ark.; Sec., Eclectic Bd., Dr. C. E. Laws, 803½ Garrison Ave., Ft. Smith.

CONNECTICUT: New Haven, Nov. 12-13. Sec., Regular Bd., Dr. C. A. Tuttle, 196 York St., New Haven; Sec., Eclectic Bd., Dr. James E. Hair, 730 State St., Bridgeport; Sec., Homeopathic Bd., Dr. E. C. M. Hall, 82 Grand Ave., New Haven.

DELAWARE: Wilmington, Dec. 10-12. Sec., Dr. H. W. Briggs, 1026 Jackson St., Wilmington.

FLORIDA (R.): Miami, Dec. 2-3. Sec., Dr. W. M. Rowlett, Citizens Bank Bldg., Tampa.

ILLINOIS: Chicago, Dec. 9-11. Mr. F. C. Dodds, Supt. of Registration, Springfield.

IOWA: Des Moines, Dec. 10-12. Sec., Dr. G. H. Sumner, Capitol Bldg., Des Moines.

LOUISIANA: New Orleans, Dec. 2-4. Sec., Dr. E. W. Mahler, 730 Audubon Bldg., New Orleans.

MAINE: Portland, Nov. 12-13. Sec., Dr. Frank W. Searle, 776 Congress St., Portland.

MARYLAND: Baltimore, Dec. 10. Sec., Dr. J. McP. Scott, 137 W. Washington St., Hagerstown.

MASSACHUSETTS: Boston, Nov. 12-14. Sec., Dr. Walter P. Bowers, No. 1 Beacon St., Boston.

NEBRASKA: Lincoln, Nov. 13. Sec., H. J. Lehnhoff, 514 First Natl. Bk. Bldg., Lincoln.

OHIO: Columbus, Dec. 3-5. Sec., Dr. H. M. Platter, State House, Columbus.

SOUTH CAROLINA: Columbia, Nov. 12. Sec., Dr. A. Earle Boozer, 1806 Hampton St., Columbia.

TEXAS: Dallas, Nov. 19-21. Sec., Dr. M. F. Bettencourt, Mart.

VIRGINIA: Richmond, Dec. 10-13. Sec., Dr. J. W. Preston, 215 S. Jefferson St., Roanoke.

WEST VIRGINIA: Charleston, Nov. 19-21. Sec., Dr. S. L. Jepson, Masonic Bldg., Charleston.

Iowa July Reciprocity Report

Dr. G. H. Sumner, secretary of the Iowa State Board of Medical Examiners, reports that 7 candidates were licensed through reciprocity at the meeting held July 15, 1918. The following colleges were represented:

College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
Bennett Medical College		(1914)	Illinois
Northwestern University		(1905) (1913)	Illinois
American Medical Missionary College		(1904)	Illinois
National University of Arts and Sciences		(1913)	Illinois
St. Louis College of Physicians and Surgeons		(1911)	Missouri
University of Nebraska		(1904)	Nebraska

Washington July Examination

Dr. C. N. Suttner, secretary of the Washington State Board of Medical Examiners, reports the written examination held at Tacoma, July 2, 1918. The examination covered 11 subjects and included 110 questions. An average of 75 per cent. was required to pass. Of the 38 candidates who took the physician's and surgeon's examination, 30, including 2 osteopaths, passed, and 8, including 2 chiropractors, failed. Ten candidates were granted osteopathic licenses. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
College of Medical Evangelists		(1918)	94.3
College of Phys. and Surg., Los Angeles		(1918)	85, 87.5
College of Phys. and Surgs., San Francisco		(1918)	92.4
George Washington University		(1905)	89.2
Hahnemann Medical Coll. of the Pacific		(1914)	89.1
Bennett Medical College		(1915)	88.8
Jenner Medical College		(1917)*	85.7
Northwestern University		(1913) 91.2; (1918)	87.2, 92.5
Rush Medical College		(1903) 83.1; (1918)†	92.5
University of Illinois		(1913)	89.8
Maryland Medical College		(1911)	79.4
Middlesex College of Medicine and Surgery		(1917)	83.4
St. Louis University		(1918)	94.3
University of Buffalo		(1910)	85.6
Medical College of Ohio		(1896)	81.9
Univ. of Ore. (1906) 88.4; (1910) 84.1; (1912) 84.9;		(1918)	85.3, 85.5
Vanderbilt University		(1917)	89.6
University of Toronto		(1911)	89.9
Tokyo Charity Hospital Spec. Med. School		(1917)	83.1
University of Christiania		(1896)	85.5

* Graduation not verified.
† Degree withheld pending completion of hospital internship.

	FAILED		
Rush Medical College		(1883)	62.1
Baltimore Medical College		(1891)	59.8
University of Maryland		(1898)	39.3
Saginaw Valley Medical College		(1902)	63.5
Kansas City Medical College		(1889)	52.1
Western University		(1907)	68.9

Book Notices

RADIOGRAPHY AND RADIO-THERAPEUTICS. By Robert Knox, M.D., M.R.C.S., L.R.C.P., Consulting Radiologist, Great Northern Central Hospital, London. Part II: Radio-Therapeutics. Cloth. Price, $6.50. Pp. 606, with 115 illustrations. New York: The Macmillan Company, 1918.

This volume is devoted to both roentgen and radium therapy. The action of radiations on normal and pathologic tissues is dwelt on at some length. The roentgen armamentarium suitable for therapeutic use is described, as are also the methods of protection for patient and operator, the means used to estimate dosage, and the use of filters. Rather scant mention is made of the Coolidge tube—not at all commensurate with its importance and value in modern roentgen therapy. The chapters devoted to the various conditions suitable for treatment and the technic employed are also rather condensed. The physics of radium is dwelt on in detail by C. E. S. Phillips. The practical application of radium to disease, including the various methods of using it, the dosage and the conditions amenable to its action, is thoroughly covered. A chapter on the combined use of radium and roentgen rays in the treatment of malignant disease gives some relative values of the two agents in different conditions. The equipment of a radiotherapeutic department to meet the needs of military practice is described, as are also the types of cases encountered in such practice. In a chapter on the value of radiations in plastic surgery of the face and jaws, by Percival P. Cole, special attention is called to the value of the depilating effects of radiation when flaps from hairy parts are use to cover defects in nonhairy parts, and to the softening effects in old scars and keloids developing in such scars.

CLINICAL DISORDERS OF THE HEART BEAT. A Handbook for Practitioners and Students. By Thomas Lewis, M.D., F.R.S., D.Sc., Physician of the Staff of the Medical Research Committee. Fourth edition. Cloth. Price, $2.25. Pp. 120, with illustrations. New York: Paul B. Hoeber, 1918.

This is essentially a reprint of the third edition, yet new facts are added here and there in a few words or a short paragraph, or some modification of statement is made so that it may justly be stated that there has been a careful revision. The worth of the volume has been many times declared by teachers and reviewers, and is plainly attested by the demand for the fourth edition. Not the least valuable feature is the preface, which clearly sets forth the debt owed by cardiology to the electrocardiograph and polygraph, but which also points out the fact that without these instruments of precision the general practitioner, by understanding the processes underlying cardiac irregularities, may recognize and intelligently treat these otherwise puzzling conditions.

FARMERS' CLEAN MILK BOOK. By Charles Edward North, M.D., Director, North Public Health Bureau, New York City. Cloth. Price, $1.00 net. New York: John Wiley & Sons, 1918.

This little book is intended primarily for the use and instruction of the progressive farmer. It is fully illustrated with photographs, and will doubtless be of material service in furthering the production of sanitary milk. Chapter 12, entitled "The Dairy Man More Important than the Dairy," describes a striking instance of the production of milk with a low bacterial count by simply shifting milkers from one farm to another. The book will be appreciated by all interested in the production of clean milk.

ELEMENTS OF HYGIENE AND PUBLIC HEALTH. For the Use of Medical Students and Practitioners. By Rai Bahadur Jaising P. Modi, L.R.C.P. & S., L.F.P.S., Lecturer on Medical Jurisprudence, Hygiene, Chemistry and Physics, Agra Medical School. With an Introduction by Lieut.-Col. E. J. O'Meara, F.R.C.S., D.P.H., I.M.S., Principal, Agra Medical School. Cloth. Price 4 rupees net. Pp. 337, with 69 illustrations. Calcutta: Butterworth & Co., 1918.

This book is written with special reference to conditions existing in India and the East. It is intensely practical, and the numerous "shoulds" and "should nots" make evident the class of reader for whom it is intended. The directions given for furthering sanitation and preventing disease are, on the whole, clear and sensible. The book contains an important chapter on village sanitation and one on fairs, famine camps and poorhouses, both of which deal in detail with the peculiar conditions in India. Altogether, the book ought to be of great service to those directly concerned with Asiatic conditions of life. The paper used in the book deserves special mention; it is so thin that much valuable material is included in a relatively small bulk, and yet sufficiently opaque as to make it easy to read. The book is printed in India, and evidently this is true "Indian" paper.

Medicolegal

Automobilist Liable on Verbal Promise to Pay for Care of Injured Boy

(Banfield v. Davidson (Texas), 201 S. W. R. 442)

The Court of Civil Appeals of Texas affirms a judgment in favor of Plaintiff Davidson for $291.45, the amount sued for, for the care and treatment at his hospital of a boy, named Johnny Van, who was injured and brought there by defendant Banfield. The court thinks there was sufficient evidence to support a finding by the jury that the defendant negligently ran his automobile against the boy, who was at the time riding a bicycle, and that by such negligent act the boy's leg was broken, and other injuries inflicted on his body; that the boy was immediately taken by the defendant to the plaintiff's hospital, and that on reaching the hospital the defendant told the plaintiff to take the boy into his hospital and give him all necessary attention, and to try to save his life, and that the defendant would pay the plaintiff for such services, etc.; that the plaintiff did take the boy into his hospital on such request of the defendant, and did give him all necessary medical treatment and hospital accommodations and attention, as requested by the defendant, for about six weeks, and that such medical services, etc., were reasonably worth $291.45.

The defendant denied making any such promise, either expressly or by implication, and said further that if he did make such promise the same was verbal only and not in writing, and that as the sum due the plaintiff was the debt of Johnny Van, and not the debt of the defendant, the defendant could not be held liable therefor, and he specially pleaded the statute of frauds, which provides that no person shall be held liable for the debt, default or miscarriage of another, unless such person shall by some agreement or memorandum in writing, signed by the promisor or by some person by him authorized, promise to pay such debt, default or miscarriage of the other. But the court holds that the agreement to pay the plaintiff for his services was an original undertaking of the defendant. There was no contention by either party that it was alleged in the pleadings of either party or shown by the evidence that medical services or hospital accommodations given to Johnny Van were first performed, and thereafter a promise was made by the defendant to pay the reasonable value for such services, etc. There was no evidence calling for a charge on the statute of frauds. The cause of action alleged and proved was not within the statute of frauds.

The trial court gave the jury the following special charges requested by the plaintiff:

A promise to pay for services rendered to a third person at the promisor's request is an original undertaking, not within the statute of frauds. Therefore, if you find from the evidence in this case that defendant promised to pay plaintiff for the services rendered Johnny Van, if any, by plaintiff, and that such services were rendered said Johnny Van at the request of defendant, then such promise need not be in writing, and defendant would be liable to pay for the reasonable value of such services, and if you so find by a preponderance of the evidence, you will find for the plaintiff in such amount as you may find the reasonable value of such services. . . .

Where one does for another that which the other is legally obligated to do, the law not only implies a previous request that the thing should be done, but a promise to compensate. Therefore, if you find in this case that defendant was driving his car at a reckless and

dangerous rate of speed, and thereby struck and injured the witness, Johnny Van, without any negligence on the part of the said Johnny Van, then defendant would be legally liable for such injuries and the services rendered by plaintiff in this case to witness Johnny Van, and if you so find, you will find for the plaintiff in such amount as said services are reasonably worth; notwithstanding you may find from the evidence that defendant did not promise to pay for such services.

The Court of Civil Appeals thinks that by this special charge the trial court fairly submitted to the jury every legal issue raised by the pleadings and the evidence.

Liability of Hospital for Injury to Physician Accompanying Patient

(Marble v. Nicholas Senn Hospital Association (Neb.), 167 N. W. R. 208)

The Supreme Court of Nebraska, in affirming a judgment in favor of the plaintiff for $8,500 damages for personal injuries, holds that the doctrine that a charitable institution, conducting a hospital solely for philanthropic and benevolent purposes, is not liable to inmates for the negligence of its servants does not extend to a physician who, by invitation, enters the hospital with a patient to procure a roentgenogram for the latter and is injured through the negligence of the roentgenologist. The court says that the plaintiff, a practicing physician, went to the roentgen-ray room in the defendant's hospital with a patient, a little girl, to get a roentgenogram of her head. Her father sat on a chair in front of the machine with her on his lap, and the plaintiff attempted to comply with a request of the operator to hold the child's head. The plaintiff's head at the time was near the wires that carried the electric currents to the tubes, and after the electricity had been applied to the wires he fell to the floor, breaking his left leg. The defendant was charged with negligence in placing the plaintiff where his body made a short circuit for escaping currents; in failing to warn the plaintiff of the dangers of such close proximity to the wires; in failing to use an available appliance to keep the wires a safe distance from the plaintiff; in failing to place the roentgen-ray machine where the dangerous wires would be vertical, thus keeping them at a safe distance, and in failing to provide a competent and experienced roentgen-ray operator. The defendant denied negligence on its part, and pleaded that it was an eleemosynary institution which, as such, was not liable for the negligence of its servants; that the plaintiff assumed the risk of contact with the electric currents, knowing the obvious, existing dangers; that the plaintiff fell in an epileptic convulsion, his injury being the result.

The proposition that there should have been a nonsuit on the ground that the defendant was an eleemosynary institution, and that as such it was not pecuniarily liable for the negligence of its servants, was based on the principle of law that "a charitable institution conducting a hospital solely for philanthropic and benevolent purposes is not liable to inmates for the negligence of nurses" (*Duncan* v. *Nebraska Sanitarium & Benevolent Association*, 92 Neb. 162, 137 N. W. 1125). In the case cited, immunity from liability is limited to "inmates." The rule thus announced has the support of precedent, but in a recent opinion of the Supreme Court of Virginia, after an extended analysis of the cases, it was held that the doctrine of nonliability to inmates did not extend to strangers, the modern theory being:

> One who at the request of a patient about to enter a hospital accompanies him to render reasonably necessary assistance is an invitee of the hospital, to whom it owes the duty of exercising ordinary care to have the premises reasonably safe (*Hospital of St. Vincent of Paul* v. *Thompson*,, 116 Va. 101, 81 S. E. 13).

In a recent article on hospitals it was said:

> The theories of the immunity of a hospital from liability on the ground of public policy and on the ground that the assets are a trust fund having been generally rejected by the courts, and the doctrine of waiver by acceptance of benefits being applicable only to patients, the law has come to be that as to others not the recipient of the institution's charity the rule of responsibility for the negligence of its servants and agents is applied as in cases of the ordinary business corporation (13 R. C. L. 948, Section 12).

This view of the law conforms to correct standards of justice, and defeated the immunity pleaded in the answer of the defendant.

Society Proceedings

COMING MEETINGS

American Public Health Association, Chicago, Dec. 9-12.
Medical Association of Porto Rico, Ponce, Dec. 14-15.
Southern Surgical Association, Baltimore, Dec. 17-19.
Western Roentgen Society, Chicago, Nov. 20-22.

INTERSTATE ASSOCIATION OF ANESTHETISTS

Fourth Annual Meeting, held at Indianapolis, Sept. 25-27, 1918

The President, Dr. E. I. McKesson, in the Chair

SYMPOSIUM ON ANESTHESIA IN WAR SURGERY

General Considerations

Capt. C. N. Combs, M. C., U. S. Army, Terre Haute, Ind.: Anesthesia in war surgery, both at the front and in the rear, differs very materially from anesthesia in civilian hospitals. It is distinctive on account of (1) the type of patients; (2) their condition at the time of operation, and (3) the peculiar nature of the operative procedures. In civilian hospitals, during peace, it is the exception to have strong, healthy young men to anesthetize, the majority of patients being women and children, or else men with a definite organic or inflammatory lesion and often well prepared for any operation. Military patients are frequently robust men, who have lived an outdoor life for varying periods, and many of them have been in the trenches and subject to war strain and nervous exhaustion. Men suffering from shell shock require much more anesthetic than other men, and they have a tendency to excitement while going under, the nervous element involved seemingly being the real causative factor. It is impossible, in many cases, to judge by the appearance of the men how they are likely to behave under an anesthetic.

During the winter months, bronchitis is prevalent; but in spite of cough, expectoration and congestion, these patients are good subjects for anesthesia, and the incidence of postoperative pneumonitis is negligible. Anesthesia for such patients must be safe, rapid and convenient. Gas-oxygen, with or without ether, and C. E., with or without oxygen, are invaluable. Gas-oxygen and ethyl chlorid have the great advantage of enabling the patients to be evacuated rapidly in complete control of their faculties. Severely wounded patients require very expert handling on the part both of the surgeon and of the anesthetist. They may be suffering from primary or secondary shock, hemorrhage, sepsis, gas gangrene or gassing, all associated with imperiling falls of blood pressure. Combative measures include application of heat; giving of alkaline drinks; direct blood transfusion, or the intravenous use of calcium hypertonic gum solution. Sodium bicarbonate solutions are of value in combating milder degrees of shock, the toxemia of sepsis and the air hunger of acidosis.

Rebreathing is a resuscitative measure for fat embolism following multiple fractures of the long bones. Opiates must be used cautiously. If more than one-fourth grain has been given in cases of shock, and chloroform is administered, the patient is likely to die on the table. With ether the patient's condition actually improves during operation, but the patient will collapse an hour or two afterward. If the ether is given intravenously, the patient's condition improves strikingly, but there is profound collapse later, which is often fatal. Incomparably good results are obtained with gas-oxygen anesthesia in shocked patients. Warmed ether or C. E. vapor with oxygen has proved of exceptional value in critical cases. The Depage mixture of chloroform, ether and ethyl chlorid has so far proved itself the most adaptable anesthetic for brief narcosis for painful dressings and bedside surgery.

Training Anesthetists for Service at the Front

Col. A. Primrose, C. A. M. C., Toronto, Canada: The problem of getting an adequate number of skilled anesthetists

at the front is one of immense importance. Conditions at the front are such that all operative procedures are postponed, if possible, until the wounded man reaches the casualty clearing station. Here, intensive operative work is carried out and a large number of critical cases are dealt with, and it is here that the greatest need for skilled anesthetists is felt. The surgeons working in the casualty clearing stations require skilled anesthetists, if efficient, life-saving work is to be done. In England, at headquarters, we felt this necessity, and recently established a training school for anesthetists in one of our large base hospitals at Buxton. Medical officers are especially trained there as anesthetists. The forms of anesthesia include: ether on the open mask; warmed ether vapor by special apparatus; nitrous oxid-oxygen; rectal and spinal anesthesia, with some instruction also in the use of chloroform, ethyl chlorid and the various methods of using local anesthesia. This group of trained anesthetists will be valuable for our various hospital units. In times of stress a Canadian casualty clearing station may have two or three such specialists.

Auscultatory Control of Anesthesia for Operations Under the Fluoroscope

LIEUT. A. E. GUEDEL, M. C., U. S. Army, Indianapolis: The fact that many operations at the front are now performed preferably in the dark under the fluoroscope has necessitated the development of some method of controlling anesthesia under such operative conditions without jeopardizing the safety of the wounded soldier. A vapor apparatus has been developed out of the stock material supplied to each laboratory contingent of the American medicomilitary forces. An auscultatory tube has been added to this outfit, and by means of it the anesthetist, with the ear piece in place, can determine: (1) the patient's respiration; (2) whether or not the nasal tubes remain patent; (3) whether or not the patient is swallowing; (4) whether or not the patient's larynx is being flooded with mucus; (5) the slightest effort of the patient to cough or vomit, indicating too light anesthesia, and (6) the amount of air bubbling through the ether, thus enabling the anesthetist to ascertain the approximate strength of the anesthetic vapor. This may also be determined by the sense of smell as well as by sound. This auscultatory control of anesthesia is especially serviceable in dark-room surgery, such as the removal of shrapnel under fluoroscopic examination. Here the anesthetist is not able to see his patient's customary reflexes under anesthesia, but he must of necessity conduct his anesthesia in accordance with the signs and symptoms obtained through the use of the auscultatory tube. Needless to say, it takes an expert anesthetist at the end of the auscultatory tube to appreciate what is happening to the patient and the vapor apparatus. This device has seen sufficient service to prove its worth conclusively.

Ethylene-Ether Analgesia

DR. JAMES COTTON, Toronto, Canada: Chemically pure ether is no anesthetic at all, but after standing several days it becomes an excellent anesthetic. The gas ethylene is the product giving ether its potency for pain relief. Ethylene ether, a combination of chemically pure ether with ethylene gas, has properties differing very materially from those of ordinary anesthetic ethers. Under ethylene ether, given by a closed or semiclosed method to confine and use the available ethylene gas, profound analgesia may be secured without loss of consciousness and with scarcely any effect on the ordinary reflexes, which have heretofore governed the maintenance of anesthesia. It is quite possible to perform major operations under this ethylene-ether analgesia. Instead of depressing the circulation it stabilizes it, and this fact seems to play an important part in the incidence of analgesia, as it is coincident with the stabilization of blood pressures. The pupil instead of becoming dilated remains responsive to the light reflex and does not roll. Patients not only retain consciousness but in some instances have answered the telephone during operations and eaten meals. Ethylene ether stimulates the higher centers to excessive cerebration and provokes an intense hunger which must be satisfied. This stimulation continues for hours after the anesthetic is discontinued, and is in striking contrast to the toxic condition manifested after ordinary ether anesthesia. In fact, ethylene-ether analgesia raises the question as to whether or not previous conceptions of anesthesia have not been entirely based on the toxic rather than the analgesic and anesthetic effects of ether. It is possible to accomplish unconscious anesthesia with ethylene-ether, when the patient demands unconsciousness, but the recovery from this deeper state of anesthesia is equally rapid and pleasant. It would appear that one ether that has established itself in most surgical clinics as routinely potent derives its especial potency from the fact that being manufactured by a sulphuric acid process it contains from one-half to 1 volume of ethylene. Much larger volumes of this gas are necessary, however, to secure the peculiar effects of ethylene-ether analgesia and anesthesia. It would seem adaptable to all operative procedures, except tonsil operations, for which it does not sufficiently obliterate the throat reflexes, although it obviates all pain. Skilled throat specialists have used it with satisfaction even for tonsillectomies.

Being so free from the usual toxic effects of ordinary ether anesthesia, ethylene ether has made it possible to study the detrimental effects of tobacco smoking preliminary to operations and to determine that some brands of tobacco, when the smoke is inhaled, may even spell disaster if used previous to operation by wounded soldiers. Ethylene ether requires an expert anesthetist to understand its administration and use it successfully.

(To be continued)

MEDICAL SOCIETY OF THE STATE OF PENNSYLVANIA

Sixty-Eighth Annual Session, held at Philadelphia, Sept. 23-26, 1918

The President, DR. WALTER F. DONALDSON, Pittsburgh, in the Chair

Interpretation of the Manifestations of Shock

DR. C. C. GUTHRIE, Pittsburgh: Our studies in the search for the causative mechanism have been, for the most part, negative. The evidence points rather to the central nervous system as the probable seat of primary change, particularly to the bulbar mechanism presiding over circulation and respiration. Results obtained in pronounced shock showed that both reflex vasomotor and respiratory response may be decreased profoundly. Decrease in reflex augmentation of arterial blood pressure occurred, both actual and in percentage of blood pressure. That the result in some instances was not due to stimulation fatigue was demonstrated. That it was not due to fatigue of a single path due to repeated stimulation, or to possible localized central fatigue, was also shown. We are inclined to believe that shock of sudden onset in normal individuals preponderatingly is of inhibitory character, which is in agreement with a view expressed by Meltzer. It is recommended that the term "shock" be reserved for the condition exemplified by the acute clinical state, and that the term "collapse" be employed to designate the moribund state following shock or any other condition. Experimental evidence supports the probability that the primary derangement in shock is of nervous character. In collapse, indirect and general considerations strongly indicate profound nervous derangement. The conditions in shock and collapse differ fundamentally, and treatment indications differ accordingly. In shock associated with severe hemorrhage, restoration of blood volume is indicated. For this purpose transfusion seems best, but beneficial action may be obtained by intravenous injections of artificial solutions. The addition of a colloidal substance to such solutions causes their longer retention. For this purpose, dilute acacia seems preferable to other substances hitherto employed. Preventive measures and prompt treatment are strongly indicated.

Surgical Shock in Face Mutilations and Coincident Injuries

DR. JOHN B. ROBERTS, Philadelphia: The term "shock" is used to cover many symptoms following injury—anemia, fat embolism, rapid absorption of septic fluids, rapid abstraction of heat from abdominal organs. The complete recovery seen

at times indicates that the basic lesion is susceptible of repair, wherever situated. Porter's conclusions relative to fat embolism, enforced inhalation of carbon dioxid, were apparently largely founded on examination of cases a good many hours after injury. Lowering of the alkali reserve in the blood after anesthesia and operative attacks, and the beneficial effect of intravenous use of alkaline solutions have seemed to indicate a possible relation between shock and acidosis. Henderson and Haggard see a suggestive cause of surgical shock in a connection between the excessive respiration due to pain and the carbon dioxid capacity or alkali reserve of the blood. For prevention of shock there must be avoidance of fall of blood pressure, prevention of pain, and control in severity of traumatism. Ether, the most satisfactory of the usually inhaled anesthetics, is said to reduce blood pressure, and is toxic to nerve tissue and glandular organs. Nitrous oxid with ether following, or in association with nerve blocking, is at times available. Geoffrey Marshall uses nitrous oxid gas with oxygen to lessen shock in amputation. He says that shock evades exact definition. I fear his experience is more that of an anesthetist than of an operating surgeon. Porter finds that a diastolic blood pressure of from 45 to 50 mm. continued for a considerable time in a laboratory animal is followed by death by transfer of blood to the portal veins unless the animal is saved by surgical treatment. Treatment, therefore, requires that the blood pressure of the wounded, in war or civilian practice, be raised above the critical point. Elevation of the feet and intravenous injection of saline solution will raise diastolic blood pressure to 70 or 80 mm.; such procedure is to be used in addition to elevation of legs and trunk. Epinephrin may be employed in addition if the pressure falls again. Too much saline solution may increase hemorrhage in oozing wounds, unless hemostasis or operation and hemostasis have been successfully employed. Transfusion of blood is then acceptable, but hemostasis must also be looked after. External heat is of the highest importance. Pressure is to be made on the wound and not by tourniquet above the wound. Geoffrey Marshall's objection to morphin is probably founded on anesthetic observations rather than on the study of clinical surgery as an operating surgeon. C. L. Gibson of New York strongly advises the use of morphin to prevent shock, stating that its generous use makes the journey of the wounded man to the next station comfortable; also that it has been found to be of great value previous to operations with a marked effect in diminishing shock. The preliminary hypodermic use of morphin and atropin will probably convince operators that Geoffrey Marshall's objection to ether in amputation cases is probably not well founded. Surgeons must remember that saline solution is not well absorbed in shock cases; it may take some time to get the beneficial effect of gravity and intravenous medication. Frequent blood pressure observations combined with temperature observations will determine the indications for cessation or diminution of activity in treatment.

DISCUSSION

Dr. S. J. Meltzer, New York: The theory of acapnia assumes that shock is due to a diminution of carbon dioxid in the blood of patients in shock. This assumption suggests the treatment—letting the patient breathe some carbon dioxid or respire through a long tube or, as it is termed for short, rebreathing. If the statement that the carbon dioxid of the blood is decreased in shock were generally confirmed, the fact of the reduction of carbon dioxid could not prove the correctness of the acapnia theory. The reduction of carbon dioxid may merely be a consequence of shock and not the cause of it. Geoffrey Marshall, an expert anesthetist, is of the opinion that rebreathing is rather a dangerous procedure and ought not to be used in shock patients. Acapnia and rebreathing, as far as the science of physiology is concerned, are dying. Cannon studied shock experimentally as well as clinically. He believes that the most essential factor in the production of shock is acidosis and advocates the treatment of shock by the administration of sodium bicarbonate. Bayliss gave up the idea that acidosis is of primary importance in shock, and lost faith in the value of the alkaline treatment of shock. The theory that shock is produced by pulmonary fat embolism received a great deal of attention. No doubt there are cases in which fracture of the long bones or injuries to fat tissues lead to pulmonary fat embolism and to a dangerous and even to a rapidly fatal fall of blood pressure. But these facts are in no way new. Fat embolism, a grave condition, presents a number of definite clinical symptoms outside of the presence of low blood pressure. There are, in the first place, symptoms that point directly to the lungs as the seat of trouble. The patient is suffering from air hunger, dyspnea; pulmonary edema and even hemoptysis are frequently present. On auscultation, râles may be discovered. Fat is present in the circulation in abnormal quantities. The urine contains fat globules. Even the sputum may reveal fat. Porter recommends the inhalation of carbon dioxid for the treatment of shock, and reports that he has helped many such patients by this treatment. Porter administers carbon dioxid not for the purpose of meeting the possible exigencies of acapnia but for the purpose of producing deep inspirations, which would help drive the blood from the engorged abdominal veins into the half empty heart. Wiggers says that if the circulation from the right ventricle is impeded by capillary emboli in the lungs, the introduction of larger quantities of blood into the right ventricle might lead to the dilatation of that ventricle and to death. According to Wiggers, shock is distinguishable from pulmonary fat embolism by the difference of the pressure in the right ventricle and the pulmonary artery; in pulmonary fat embolism the pressure is rather high, while in shock it is low. Therefore, while in shock it is advisable to drive the blood from the veins of the abdominal cavity into the right ventricle, this procedure has to be avoided in cases of pulmonary fat embolism. Neither Porter's theory of shock nor his therapeutic advice rendered a practical service to medicine.

The Ductless Glands in Military Practice

Dr. Charles E. de M. Sajous, Philadelphia: So far as recruits are concerned, proper recognition of the diseases of the ductless glands and their treatment would enable a large proportion of men now deemed unfit to continue their service. As for the armies in the field, it is a question of life and death in the large proportion of cases of disease of the suprarenals or of the thyroid, including many cases of so-called "soldier's heart," as regards the latter organ. All this should be taken to heart by our military authorities, if their excellent work in other directions is to encompass all fields of suffering.

DISCUSSION

Dr. John A. Lichty, Pittsburgh: In considering the disturbances of internal secretion there are always two points that come out necessarily. One of these is the early recognition of disturbance of function in typical cases; the other is the recognition of the aberrant cases. The treatment depends entirely on the stage at which the case is met. In the thyroid or other glands of internal secretion, if a case is met at a time when only the vegetative nervous system is affected, surgery, of course, is not to be considered. These are the cases in which rest is the factor. If the condition gets to a certain point where neither of these factors, rest, forced feeding or the administration of an internal secretion are helpful, when it has gone beyond our control, we might say, then, of course, some direct effect on the gland itself will have to be brought about; and under these circumstances, surgery will no doubt be called into play.

Dr. E. Bosworth McCready, Pittsburgh: The reports of the Army medical examiners show how prevalent are organic and functional defects of development among the adult male population. Surveys of large groups of children have shown the existence of malnutrition to an almost incredible degree. It is to a large extent these malnourished, asthenic children who later develop glandular anomalies. Food quality and food quantity is a factor in metabolism, but only a factor. Metabolism depends on a proper balance of all physiologic functions, particularly on those of the ductless glandular apparatus. Preventive treatment should begin before the child is born, through proper parental care, including, when indicated, the administration of ductless gland preparations to the mother.

(To be continued)

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

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1 Puericulture in France. M. P. Strauss, Paris, France.—p. 207.
2 Red Cross Infant Mortality Campaign in France. W. P. Lucas (San Francisco), Paris, France.—p. 212.
3 Work of Children's Bureau of American Red Cross in Lyons. C. G. Grulee (Chicago), Paris, France.—p. 220.
4 Public Health Problem in France. C. F. Gelston (San Francisco), Paris, France.—p. 226.
5 American Red Cross in Meurthe-Et-Moselle. M. Ladd (Boston), Paris, France.—p. 236.
6 America's Debt to France. J. H. M. Knox, Jr. (Baltimore), Paris, France.—p. 242.
7 Massachusetts Child Conservation Committee: Details of Organization and Work. R. M. Smith, Boston.—p. 253.
8 Etiology of Phlyctenular Disease of Eye. H. F. Hansell, Philadelphia.—p. 262.
9 Is Amount of Calcium Usually Given in Dilutions of Cow's Milk Injurious to Infants? A. W. Bosworth, H. I. Bowditch and L. A. Giblin, Boston.—p. 265.
10 Bearing of Cutaneous Hypersensitiveness on Pathogenicity of B. Abortus Bovinus. E. C. Fleischner and K. F. Meyer, San Francisco.—p. 268.

American Journal of Obstetrics and Diseases of Women and Children, York, Pa.

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11 New Psychology Applied to Neuroses of Gynecology. W. P. Graves, Boston.—p. 497.
12 Indications and Limitations of Induction of Labor. R. C. Norris, Philadelphia.—p. 507.
13 Positive Wassermann Reaction which Changes to Negative at Termination of Pregnancy. M. L. Menten, Pittsburgh.—p. 514.
14 Red Degeneration of Fibroids During and Following Pregnancy. H. Schiller, Chicago.—p. 519.
15 Funnel Pelvis. Report of One Hundred and Six Cases. H. Williamson, New York.—p. 528.
16 Delivery Room Technic. S. B. Blakely, Binghamton, N. Y.—p. 537.
17 Efficient and Inexpensive Incubator. H. Thoms, New Haven, Conn.—p. 542.
18 Scopolamin-Morphin Amnesia in Labor. W. R. Livingston, Oxnard, Calif.—p. 544.
19 A Uterine Cancer: Its Diagnosis. P. B. Bland, Philadelphia.—p. 554.
20 Plea for Prenatal Care and End-Results of Hygiene of Pregnancy. J. R. Garber, Birmingham, Ala.—p. 566.
21 Advantages of Rectal Over Vaginal Examinations During Labor. R. A. Bartholomew, Atlanta, Ga.—p. 576.
22 Diagnosis of Ectopic Pregnancy. F. A. Rhodes, Pittsburgh.—p. 580.
23 Rupture of Uterus. R. Y. Sullivan, Washington, D. C.—p. 589.
24 Use of Douche Pan in Second and Third Stages of Labor. C. J. Andrews, Norfolk, Va.—p. 595.
25 Case of Staphylococcus Albus Puerperal Infection and Psychosis. S. B. Schenck, Brooklyn.—p. 596.

Archives of Internal Medicine, Chicago

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26 *Clinical Study of Pneumonia at Fort Riley Base Hospital. W. J. Stone, Toledo, Ohio, B. G. Phillips and W. P. Bliss, New York.—p. 409.
27 *Pneumonia and Empyema at Camp Sevier. W. T. Vaughan (Ann Arbor, Mich.), and T. G. Schnabel (Philadelphia), Camp Sevier, S. C.—p. 440.
28 *Treatment of Bronchial Asthma with Proteins. I. C. Walker, Boston.—p. 466.
29 Influence of Acid Phosphate on Elimination of Ammonia in Urine. W. McK. Marriott, St. Louis, and J. Howland, Baltimore.—p. 477.
30 Botulism; Report of Cases Occurring in Pacific Coast States. E. C. Dickson, San Francisco.—p. 483.
31 Nature and Interpretation of Colloidal Gold Reaction. K. M. Vogel, New York.—p. 496.
32 *Clinical Study of One Hundred and Fifty Cases of Bronchial Asthma. F. M. Rackemann, Boston.—p. 517.

26. **Study of Pneumonia.**—Only completed cases of pneumonia treated at the U. S. Army Base Hospital, Fort Riley, Kan., from Oct. 18, 1917, to May 18, 1918, are included in this report on a series of 668 instances of lobar pneumonia, 181 instances of measles pneumonia, and twenty-two instances of bronchopneumonia. The total incidence for pneumonia was 4.5 per cent., with a mortality of 23 per cent. The mortality of lobar pneumonia without empyema was 12.7 per cent. The incidence of pneumonia in measles was 6.1 per cent., with a mortality of 45.8 per cent. The mortality of measles pneumonia without empyema was 32.5 per cent. Among the twenty-two instances of bronchopneumonia there were no empyemas, but there were two death, a mortality of 9 per cent.

The mortality with the same general plan of treatment varied from month to month in this series of pneumonias. The fatality of empyema likewise varied from month to month under the same general plan of treatment. The highest mortality in which empyema was the prominent associated pathologic condition occurred during the months of March and April. These were largely instances of overwhelming infection of rapid onset and death within a few days. The rapid onset of chill, fever and cough with tubular breathing and signs of consolidation, however small, sufficed, in the vast majority of cases, to establish the diagnosis. The roentgenogram may be of great help in making a diagnosis of questionable consolidation. In the diagnosis of bronchopneumonia some dependence should be placed on the history of previous bronchitis or measles. In the diagnosis of complications the aspirating needle was used early for the detection of empyema. Pus was frequently found without any increase in the temperature. The roentgen ray was of little help in small accumulations of fluid, but was of great help in outlining larger accumulations associated with fibrinoplastic pleural thickening. Pericarditis occurs frequently enough in pneumonia to make it an imperative rule to examine the heart with care at each visit. Serofibrinous pericarditis occurred clinically in approximately 4 per cent. of lobar pneumonias, in 2.2 per cent. of measles pneumonias. There were thirty-one instances. Twenty-four of the patients died. Pericarditis purulenta occurred only in association with empyema of subcostosternal pus pockets. Of this complication there were twenty instances, in all of which death occurred. Diphtheria was simulated in two instances by edema of the glottis incidental to a streptococcic infection. Acute peritonitis was diagnosed in five moribund patients in whom the condition was not found at necropsy.

Subcostosternal pus pockets were found in twenty-nine instances in 153 necropsies, and the diagnosis was not possible prior to death in any case, although the presence of such purulent accumulations were suspected in many instances from the combination of clinical and roentgen-ray evidence. This pocket of pus, which is usually situated on the side of the affected lung, but which may be bilateral, lies immediately beneath the sternum. It occupies the space between the median flap of lung composing the upper lobe as it lies above the fibrous layer of the pericardium. It is not in the mediastinum and should not therefore be called a mediastinal abscess. The pocket may communicate with other septal pockets or other portions of the pleura of the affected side. The vessels of the hilum may be its deepest limit or the opening to the pleura may occur through the normal pulmonary septa. This pocket is almost impossible to drain laterally, anteriorly or posteriorly by the usual thoracotomy or costatectomy. This pocket may be affected primarily and all other portions of the pleura be apparently free from pus while this one alone remains undrained and unhealed. The authors believe that the course of the infection is parietal rather than visceral, that it follows the lymph channels to the pleura from which afferent lymph vessels draining the anterior chest wall including the anterior parietal pleura, lead to sternal lymph nodes of which there are usually six on each side along the course of the internal mammary arteries. The pus pockets occur in close proximity to these nodes due undoubtedly to breaking down of these glandular structures. They have constituted a unique and very serious complication.

So-called toxic arthritis occurred in ten instances of empyema. Only one patient developed a suppurative arthritis in association with empyema in this series.

Blood cultures were taken from 100 patients with pneumonia, or suspected pneumonia, on admission. In one instance a hemolytic streptococcus was obtained from a patient with bronchopneumonia whose sputum also contained the same organism. In five instances a pneumococcus was obtained, in

two of which the patients did not develop pneumonia. The cultures were sterile in 94 per cent. Sputum determinations as to type of infection were made in 428 completed cases of pneumonia. The hemolytic streptococcus was found in 28.2 per cent. of the cases; pneumococcus Type II, in 21 per cent. In 155 empyema fluids the hemolytic streptococcus was found in 68.4 per cent., the nonhemolytic streptococcus in 5.8 per cent. The mortality in empyema, due to the streptococcus, was 61.7 per cent., while in empyema, due to the pneumococcus, the mortality was 45 per cent. Cole Type I serum was administered in doses of 100 c.c. intravenously after desensitization in Type I lobar pneumonias. Its effect was, in a large percentage of cases, immediately beneficial. This serum was administered in twenty-seven of the thirty-two cases. Among those who received the serum there were four deaths (two had meningitis and one had bilateral empyema mentioned above). The mortality in the serum treated patients was therefore 14.8 per cent. The autolyzed pneumococcic antigen of Rosenow was used in seventy patients with lobar pneumonia not due to Type I pneumococcus. The mortality was 12.8 per cent. Among 219 completed instances of lobar-pneumonia in which the patients were discharged during the same period and not treated with the antigen, the mortality was 14.6 per cent. The dosage of the antigen, 1 to 2 c.c. daily, subcutaneously, for four or five doses, produces practically no reaction. Keys' antipneumococcic chicken serum was used in thirty cases of lobar pneumonia due to the pneumococcus. One death occurred, a mortality of 3.3 per cent., with an empyema incidence of 13.3 per cent. During the corresponding period the mortality of lobar pneumonia in patients not treated with this serum was 14.2 per cent. The serum seemed to possess value in reducing the toxemia in pneumonia.

Measles patients received, since Feb. 15, 1918, a vaccine prepared from five local strains of streptococci and two strains of Pneumococcus IV. The incidence of measles pneumonia, prior to the use of the prophylactic vaccine was 6 per cent. The incidence of measles pneumonia in 148 cases in which the prophylactic vaccine was used was 2 per cent. Antistreptococcus serum was used intravenously, after desensitization, in measles pneumonia due to the streptococcus with beneficial results in many instances.

The total number of empyema complications following pneumonia in this series was 200. Of this number 119 men were operated on. In the cases (eighty-three) in which early operation was done, not preceded by repeated aspirations, the mortality was 63.8 per cent. In the cases in which late operations were done, preceded by repeated aspirations, the mortality was 22.2 per cent.

27. **Pneumonia and Empyema.**—In lobar pneumonia the mortality for the entire period from the opening of the hospital at Camp Sevier until March 31, 1918, was 14.9 per cent. The highest number of deaths occurred during the early days of the hospital. In a period from Dec. 1, 1917, until March 31, 1918, during which more accurate records were kept, type determination was made, better methods of isolation were employed and the treatment was supervised in all wards by one person, the mortality was decidedly lower, being 10 per cent. In this second period nearly all of the cases fall, 201 out of 234. The death rate with Type I pneumonia is recorded as 14 per cent., and from Type IV as 7 per cent. There were no deaths among the eleven cases of Type II pneumonia. The Type I mortality includes both serum treated cases and those not so treated. In bronchopneumonia the death rate has been 36 per cent. Vaughan and Schnable consider Type I immune serum as being a most valuable addition in the treatment of pneumonia. It should be used in all cases of Type I infection; the earlier in the course of the disease the more satisfactory will be the results. Polyvalent serum was used in a few cases of severely ill bronchopneumonias and without beneficial results.

28. **Treatment of Bronchial Asthma with Proteins.**—The results of the treatment of 100 sensitive patients with the proteins to which they were sensitive are recorded by Walker. Of forty-eight patients who were sensitive to and treated with horse dandruff proteins, 63 per cent. were relieved of asthma, 10 per cent. have had too little treatment to warrant a prognosis, and 20 per cent. were relieved by vaccines or by omitting foods to which they were sensitive; in the remaining 7 per cent. of this group treatment was a failure. Of four patients who were sensitive to and treated with cat hair protein, three were relieved of asthma, and the other patient, who was equally sensitive to the horse dandruff proteins, was relieved by treatment with them. Of thirty patients who were sensitive to the cereal grains, 74 per cent. were relieved by the omission of these from the diet, and 7 per cent. were relieved by vaccines; of the 26 per cent. who were not relieved by the omission of cereals from the diet, in 16 per cent. there was no evidence that cereals played any part in the cause of asthma, but the presence of eczema may account for these positive skin tests. Of thirty-three patients who gave positive skin tests to other foods, 50 per cent. were relieved by the omission of these from the diet, 30 per cent. more were relieved of asthma, but as the latter were also sensitive to other proteins which were also omitted from the diet at the same time, it is difficult to give credit to any special protein. The remaining 20 per cent. were not relieved of asthma, but the presence of eczema and urticaria and an acquired distaste for certain foods probably explains the idiosyncrasy. Therefore, of the total number of 100 sensitive individual patients who were treated as indicated by the positive skin tests, in 75 per cent. there was relief from asthma, in 14 per cent., although there was no relief from asthma, there was a definite idiosyncrasy substantiating the positive skin test; but in 11 per cent. the positive skin test had no apparent bearing on the patient's condition, although in only half of these, or 5 per cent., was there evidence that the skin test gave a false result. Since the 11 per cent. includes 7 per cent. who were relieved by vaccines, a total of 82 per cent. of the sensitive patients were relieved from asthma.

32. **Bronchial Asthma.**—Some of Rackemann's conclusions may be summarized as follows: "Bronchial asthma" is a symptom of some other disease condition. The 150 cases of asthma studied can nearly all be divided, according to the etiology of their attacks, into various subgroups under the general headings of "extrinsic asthma" and "intrinsic asthma." Extrinsic asthma includes 28 per cent.; intrinsic asthma includes 53 per cent. of the entire group—the other 19 per cent. being unclassified. A history of either asthma, hay-fever or food poisoning, in the immediate family, occurs in 58.7 per cent. of the cases of extrinsic asthma, but in only 10.5 per cent. of the cases of intrinsic asthma. Skin tests are of great assistance in confirming the diagnosis. Skin tests alone are of no value unless reasonably compatible with the patient's history or experience. A positive skin test is a necessary preliminary to successful specific treatment. The "nervous" element is very important in asthma, but probably does not explain why certain individuals have asthma. Treatment resolves itself into the treatment of the exciting cause. Various different therapeutic procedures sometimes yield favorable results, but these cannot be explained. The real problem—what is the fundamental disturbance of anatomy or physiology which expresses itself by attacks of asthma—remains unsolved.

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33 Industrial Anilin Poisoning in Massachusetts; Cases. T. F. Harrington, Boston.—p. 497.
34 Infant Mortality; Theory and Results. D. M. Lewis, New Haven, Conn.—p. 501.
35 Some Special Problems in Abnormal Adolescent Psychology. O. L. Bridgman, San Francisco.—p. 505.

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36 *Myrtol Poisoning; Toxicity of Eucalyptus Oil and Myrtol. L. F. Barker and L. G. Rowntree, Baltimore.—p. 215.
37 *Dakin's Solution and Dakin's Oil in Normal Peritoneal Cavity of Dog. E. G. Grey, Baltimore.—p. 221.
38 *Multiple Primary Malignant Tumors; Case of Carcinoma and Sarcoma in Same Person. R. H. Major, Rosedale, Kan.—p. 223.
39 Idiopathic Bacillus Aerogenes Capsulatus Infection. H. Greeley, Brooklyn.—p. 231.

36. **Myrtol Poisoning.**—Derivatives of plants belonging to the natural order *Myrtaceae*, and especially oil of eucalyptus

and myrtol, may in large doses cause profound intoxication. In certain persons, there is an idiosyncrasy, the symptoms of intoxication occurring after minute or therapeutic doses. The authors report one case and summarize thirty-five cases recorded in the literature. The intoxication may affect chiefly the nervous system (myrtogenic neuropathy) or chiefly the skin (myrtogenic dermatopathy); in some persons, nervous and cutaneous manifestations are simultaneously observable. Recovery occurs in most instances, though several fatalities following eucalyptus poisoning have been reported. The symptoms of intoxication of the nervous system observed in man can be reproduced in animals by subcutaneous and by intraperitoneal administration of myrtol.

The authors' patient suffered from bronchiectasis; bronchitis chronica putrida; peribronchitis fibrosa; pleuritis chronica dextra. In addition to general measures, 3 minims of myrtol in capsules thrice daily were prescribed on account of the fetid bronchitis. The patient had been taking some oil of eucalyptus and oil of sandalwood before. These he continued along with the myrtol. After having taken two capsules three times a day for eight days the face became discolored and large puffs came under each eye. The forehead looked as if it were going to break out with eczema. The left eye became nearly closed and the right partially closed from the swelling. The myrtol was stopped at once, but the swelling lasted for many days. The cough increased markedly and the heart's action became more rapid, and he was greatly depressed. The patient had been told to increase the dose of myrtol gradually until twelve capsules per day were taken, but the myrtol was stopped when only six capsules per day were ingested.

37. **Dakin's Solution and Dakin's Oil in Normal Peritoneal Cavity.**—Observations are reported by Grey in order to draw attention to the fact that the indiscriminate use of the chlorin antiseptics is not entirely devoid of danger. Both the neutral solution of chlorinated soda (Dakin's solution) and dichloramin-T in chlorinated paraffin (chlorcosane, N. N. R., "Dakin's oil"), when injected into the normal peritoneal cavity of a dog, led to an inflammatory reaction, the degree of which was directly proportional to the amount of chlorin antiseptic used. With a sufficient quantity (less chlorcosane suffices) death ensued. When either of the chlorin antiseptics was injected into the gallbladder of a dog no abnormal symptoms appeared. Following the injection of chlorcosane, however, the gallbladder becomes thickened and shrunken, though the remainder of the biliary tract shows no discernible changes. A small amount of chlorcosane, when injected into the normal pleural cavity of an unanesthetized dog, may lead to a rapid (reflex?) death.

Since chlorcosane, particularly, has been used without recognizable ill effects in certain infections of the abdominal cavity, the results from the experiments made by Grey suggest that the wall of an abscess cavity or sinus must play an important part in protecting the peritoneum in general from the effects of the free chlorin. They also suggest that the maintenance of an adequate drainage tract is an indispensable part of the technic for using antiseptics of this nature within the abdomen. Until more evidence is at hand, then, both of the chlorin antiseptics should be used in intra-abdominal infections with caution and certainly only in carefully selected cases.

38. **Multiple Primary Malignant Tumors.**—Major's patient was a woman, 60 years of age. She applied for treatment of a carcinoma involving the right side of the nose and extending to the inner canthus of the right eye. While in the hospital the patient complained a great deal of headache, had little appetite and at times talked irrationally. Death occurred rather unexpectedly. The necropsy disclosed a round-cell sarcoma of the stomach. Hence this is a case of two primary malignant growths being present in the same person at one time. One hundred and ninety-six references to similar cases are given by Major.

California State Journal of Medicine, San Francisco

October, 1918, **16**, No. 10

40 *Cerebrospinal Fluid Findings in Herpes Zoster. W. F. Schaller, San Francisco.—p. 453.
41 Is Purgation Justifiable? P. Campiche, San Francisco.—p. 455.
42 Pubiotomy. H. A. Stephenson, San Francisco.—p. 457.
43 Focal Renal Infections. L. J. Roth, Los Angeles.—p. 460.
44 Prevalence of Streptococcal Infections. R. L. Ash, San Francisco.—p. 462.
45 Method of Suturing "Y" Shaped Wounds. J. C. Egeberg, San Francisco.—p. 464.
46 Intestinal Obstruction: Case Occurring in Geophagist. H. A. Johnston, Anaheim.—p. 464.
47 Plea for Better Cooperation Between Physicians and Dentists. C. H. Wake, Los Angeles.—p. 466.

40. **Cerebrospinal Fluid Findings in Herpes Zoster.**—A lumbar puncture was performed in 21 cases of 79 cases of herpes by Schaller. In 14 cases in which a blood Wassermann alone was done 4 cases showed a positive reaction and 10 a negative reaction. The remaining 44 cases were not examined by the blood or fluid tests, nor were they clinically cases of syphilis. Nine occurred in syphilitic persons and in all but 1 of these the fluid showed a characteristic reaction of syphilis of the central nervous system. Eleven cases were negative for syphilis. However, in 5 out of these 11 cases there was a cellular increase above the normal. The globulin test in these 5 cases was negative or slightly increased. Schaller concludes that herpes zoster occurs with comparative frequency as symptomatic herpes in syphilis of the central nervous system. In nonsyphilitic herpes an increased cell count may mislead the clinician if other evidence suspicious for syphilis is brought out in the general survey of the case.

Canadian Medical Association Journal, Toronto

October, 1918, **8**, No. 10

48 Physiology of Intracranial Circulation. J. J. R. Macleod, Toronto.—p. 865.
49 Intracraniail Pressure. W. F. Hamilton, Montreal.—p. 873.
50 Surgical Relief of Increased Intracranial Pressure. A. E. Garrow, Montreal.—p. 882.
51 Acute Endocarditis in Pregnancy. G. S. Cameron, Peterboro, Ont.—p. 891.
52 Training of Surgeon. J. Halpenny, Winnipeg.—p. 896.
53 Botulism. E. C. Dickson.—p. 903.
54 After-Effects of Wounds of Chest and Their Treatment. J. Meakins and T. W. Walker.—p. 910.
55 Medical Inspection of Schoolchildren. D. J. Dunn, Edmonton, Alta.—p. 925.

Colorado Medicine, Denver

October, 1918, **15**, No. 10

56 Tasks Before Us. E. Jackson, Denver.—p. 241.

Journal of Laboratory and Clinical Medicine, St. Louis

October, 1918, **4**, No. 1

57 *Ocular Lesions Produced by Dichlorethylsulphid (Mustard Gas). A. S. Warthin, C. V. Weller and G. R. Herrmann, Ann Arbor, Mich.—p. 785.
58 *Treatment of Dichlorethylsulphid (Mustard Gas). Injuries. A. S. Warthin, C. V. Weller, L. Roos and G. R. Herrmann, Ann Arbor, Mich.—p. 833.
59 *Blood Cholesterol in Malignant Disease and Effect of Radium on Blood Cholesterol. G. Luden, Rochester, Minn.—p. 849.
60 Methods for Preparing Isoamyl Isovalerate: Satisfactory Substance to Prevent Foaming. C. H. Fiske.—p. 865.

57. **Ocular Lesions Produced by Mustard Gas.**—Warthin and his associates made a very thorough experimental and clinical study of this subject. The results are presented in detail. Summarized they are as follows: The action of mustard gas on the cornea and conjunctiva is essentially the same as that on the skin. The conjunctiva is, however, less susceptible to the action, or better protected, as the degree of necrosis produced in it is always less than that in the cornea or the epidermis. Exposures to dilute concentrations of the vapor produce slight degenerations of the corneal and conjunctival epithelium followed by a simple conjunctivitis. The use of a 2 per cent. alkaline aqueous fluorescein solution in demonstrating the necrosis of the corneal epithelium within ten to fifteen minutes after exposure to gassing has great clinical value. Exposures to stronger concentrations produce a more or less complete necrosis of the corneal vertex, extending throughout the entire depth of the cornea. Purulent exudation in the anterior chamber may occur; but no changes except congestion and edema were observed in the posterior chamber or optic nerve in noninfected cases.

In severe cases iridocyclitis and iritis may occur without secondary infection. The conjunctival epithelium also suffers

necrosis, and there results an intense edema of the subconjunctival tissues with marked congestion, multiple hemorrhages, leukocyte infiltration, and frequently secondary liquefaction necrosis. The depth of the necrosis in the conjunctiva is much less than that in the palpebral epidermis. This difference in degree of escharization can be explained, in part, by the penetration of the hair follicles on the skin surface, and in part by the moistness of the conjunctival surfaces and the lacrimation. A diffuse mild inflammation of the peribulbar tissues occurs, often with marked infiltration of the ocular muscles. No metastatic lesions of the eye could be produced experimentally by applications of mustard gas to other regions of the body, or by subcutaneous or intraperitoneal injections.

For the milder forms of mustard gas conjunctivitis the authors recommend immediate irrigation with the 0.5 to 1 per cent. chlorcosane solution of dichloramin-T followed by frequent irrigation with saturated boric acid solution. For the severe forms the same initial treatment followed by frequent irrigations with the dichloramin-T alternating with boric acid. They advise against the use of bandages or compresses bringing pressure on the eye, against the use of colloidal silver preparations, and against the use of cocain. During exposure to mustard gas vapor the dichloramin-T solution may be used as a prophylactic agent. Healing in the more severe forms results in vascularization and cicatrization of the cornea with marked disturbances in vision. Even in the milder forms of conjunctivitis, localized roughness or irregularity in the conjunctival surface may persist for weeks as the result of localized edema, hyperemia, cellular infiltration, etc. Serious refractive errors and reduction of vision result, even in mild cases. For the correction of the disturbances of vision the patient should be referred to a competent specialist.

58. **Treatment of Mustard Gas Injuries.**—The clinical resemblance of mustard gas lesions of the skin to thermal burns has led to the use of alkalis externally and to the application of air-excluding protectives, such as oils, pastes, ointments, pomades, paraffin, oiled paper, dusting powders, etc. The extensive use abroad of a 10 per cent. bicarbonate solution is the result, no doubt, of its employment in the treatment of other forms of gassing. From the laboratory standpoint and theoretically it became very evident to Warthin and his co-workers that any form of treatment covering the surface of the injured skin areas and forming an air-excluding and germ-including coating was the worst possible method of treatment. Animal experiments with zinc stearate and other forms of oily coatings confirmed this view.

Inasmuch as mustard gas causes a necrosis, more or less deep, of the skin, cornea and conjunctiva, and mucous membrane of the respiratory tract, the therapeutic problems are as follows: 1. To sterilize the dead tissue and prevent infection of the eschar. 2. To prevent further necrosis by removing pressure. 3. To promote removal of the eschar and rapid regeneration and healing without secondary infections. The use of neutral solution of chlorinated soda suggested itself as an ideal method particularly, because the use of a chlorinating solution would also serve to destroy any mustard gas remaining in the skin, hair follicles, or sweat glands. The use of the bath method, as carried out in the treatment of severe thermal burns and necrotic and suppurative conditions of the skin, and especially, because of the danger of bedsores and secondary necrosis from pressure, is founded on the pathology of the lesions produced by mustard gas, and is based on scientific principles. In practice it has produced good results.

A. Mild Injuries.—Wash immediately, or better, immerse parts one half to two hours in neutral solution of chlorinated soda (strength of about 0.5 per cent. hypochlorous acid). If too irritating, dilute the solution or shorten time of immersion. If injured surfaces are very large, use full bath; for lesions of the genital region use sitz bath. When immersion of parts is not expedient, use dressings wet with or irrigate with neutral solution of chlorinated soda. If the wet treatment (which the authors consider by far the best) cannot be carried out, the application of dichloramin-T in chlorcosane or chloramin-T in sodium stearate may be used. These procedures will serve a double purpose of chlorinating and rendering inactive any dichlorethylsulphid remaining in the skin, hair follicles, etc., and also disinfecting the damaged skin surface. This primary disinfection of the skin is of very great importance in the prevention of the secondary infections that are so often of a serious character.

After the neutral solution of chlorinated soda, use wet dressings, irrigation or bath of sterile hypertonic saline (5 to 10 per cent.), alternating with the neutral solution of chlorinated soda, and a sterile physiologic saline, according to judgment, about as follows: Neutral solution of chlorinated soda one to two hours, hypertonic saline two hours, physiologic saline one hour, and then repeat until lesions appear and extent of injury can be determined. As long as the lesion remains an erythema continue this treatment during the daytime. At night, dry the skin under aseptic precautions, and apply a vanishing surgical cream containing hypochlorous acid or liberating chlorin, of the type of the chlorazene (chloramin-T, 1 per cent. in sodium stearate) surgical cream, or instead, use wet hypertonic saline dressings.

Dusting powders are inadvisable because of crusting and possibility of infection. Chloramin-T and dichloramin-T in full strength powder form are too irritating. The authors have had no experience with Vincent's powder but on general principles would not favor its use. They also advise against the use of silver nitrate, iodin, potassium permanganate, or other local applications. Saturated magnesium sulphate solution proved irritating and no benefits were observed from its use.

In the case of vesicle formation, empty vesicles early under aseptic precautions, by means of a hypodermic syringe or sterile needle with slight pressure on the vesicle, and allow intact vesicle wall to collapse and seal down on its base. After this procedure, continue with alternating neutral solution of chlorinated soda and sterile salines, as above. If vesicles are not drained early, the fluid content may, within four to five hours, coagulate to such an extent that a large coagulum is formed that cannot be removed, and forms a possible medium for bacterial growth. It is very important that skin damaged by mustard gas be protected from trauma. Slight injuries, even ordinary pressures of the body, will cause the development of secondary vesicles or decubitus in the injured areas.

The use of unguents and ointments with oily bases, such as zinc stearate, olive oil, oleum petrolatum, or any form of crude petrolatum or other protecting oil, or such air-excluding and infection-including protectives as oiled paper, paraffin sprays and coatings, such as are employed in the treatment of thermal burns, is strongly condemned in the treatment of dichlorethylsulphid injuries. The principle of excluding the air for the purpose of lessening pain in the treatment of thermal burns is not applicable here because of the relative anesthesia of the dichlorethylsulphid lesions in their earlier stages. Exceptions to the above rule are the sodium stearate impregnated with chloramin-T and the chlorcosane solution of dichloramin-T, as in these cases there is an active and persistent germicidal agent present.

In the case of denuded surfaces with much pain and when bedsores have developed, the colloidal saline bath is strongly advocated. This bath is made as follows: Dissolve 1 pound of commercial cornstarch and 1 pound of sodium bicarbonate in 20 to 30 gallons of sterile physiologic salt solution, at a temperature of 90 to 95 F. The patient can be left immersed in this, when necessary, from fifteen minutes to forty-eight hours. The patient should be constantly watched by the nurse. Should pulse become weak, give strychnin or digipuratum or any other active digitalis preparation, or remove from bath, and apply blankets and heat.

B. Severe Injuries.—When necrosis of the skin, more or less extensive, develops, follow the same line of treatment given above: full bath, irrigation, slush or sponge bath, or wet packs of neutral solution of chlorinated soda, alternating with physiologic and hypertonic salines, or the colloidal bicarbonate bath should be constantly employed. Avoid bedsores. For this purpose the constant colloidal or saline bath, with patient hung in canvass body cradle to take off pres-

sure should be used. It is of the greatest importance to protect the damaged areas from secondary trauma. In cases in which decubitus or sloughs occur the necrotic layer should be removed, either with sterile forceps or by means of frequent hot irrigations under pressure. For this purpose saline, neutral solution of chlorinated soda, 1:10,000 potassium permanganate solution, etc., should be used. If the necrotic areas have become infected through neglect or improper treatment, the use of neutral solution of chlorinated soda or a similar solution should be pushed, alternating with hypertonic saline baths.

A hyperchlorous solution made according to Carrel's method can be applied here with good results: To 1 liter of water add 12.5 gm. of bleaching powder, shake vigorously, then add 12.5 gm. of boric acid powder, and shake again. Allow the mixture to stand for some hours, preferably overnight, then filter off, when the clear solution is ready for use. This solution contains about 0.54 per cent. of hypochlorous acid, 1.28 per cent. calcium biborate and 0.17 per cent. calcium chlorid. This is about the most practical concentration of hypochlorous acid, as stronger solutions rapidly lose strength. When the patients are very weak, temperature rising, and infection progressing it may be advisable to employ tepid sponge baths of the foregoing solutions.

59. **Studies on Cholesterol.**—Cholesterol promotes cell multiplication; high blood cholesterol values must, therefore, says Luden, further malignant growth. High blood cholesterol values are commonly found in carcinoma. Radium treatment and the administration of the thyroid hormone both reduce the cholesterol content (Bloor I) of the blood, and increase the amount of changed cholesterol in the blood (namely, the difference between the Bloor I and II values). The high cholesterol values in myxedema are brought down to normal by the administration of the thyroid hormone at a rate parallel to the rise in basal metabolism induced by the latter.

Kansas Medical Society Journal, Topeka

October, 1918, **18,** No. 10

61 Case of Foreign Body (Lead Pencil) in Abdomen. A. O'Donnell, Ellsworth.—p. 237.
62 First Aid to Neurotic. M. S. Deland, Topeka.—p. 238.

Kentucky Medical Journal, Bowling Green

October, 1918, **16,** No. 10

63 Outlook for the Profession. J. S. Lock, Barbourville.—p. 432.

Maine Medical Association Journal, Portland

October, 1918, **9,** No. 3

64 Cancer Problem. L. D. Bristol, Augusta.—p. 57.

Minnesota Medicine, St. Paul

October, 1918, **1,** No. 10

65 Study of Seventy Cases of Cerebrospinal Meningitis. M. Seham, Minneapolis.—p. 372.
66 Modern Roentgen Ray Therapy. R. F. Bellaire, Sioux City, Iowa. —p. 380.
67 Pituitary Extract, Its Uses and Abuses. J. A. Broberg, Blue Earth.—p. 386.

New York Medical Journal

Oct. 19, 1918, **108,** No. 16

68 Errors in Diagnosis of Pulmonary Tuberculosis. A. Trasoff, Philadelphia.—p. 665.
69 Endobronchial Treatment of Bronchiectasis and Bronchial Abscess. E. Mayer, New York.—p. 666.
70 Neurotic Symptoms Referred to Eyes. C. P. Oberndorf, New York.—p. 668.
71 Intestinal Stasis, Ileocecal Valve Incompetency, and Chronic Appendicitis Roentgenologically Considered. J. S. Diamond, New York.—p. 672.
72 Paget's Disease of Bones; Two Cases. B. Stivelman, New York, and E. L. Ray, Louisville, Ky.—p. 678.
73 Argyrol Treatment of Acute Anterior Gonorrhea. C. B. Adams, New York.—p. 679.
74 Functional Reeducation of Wounded. R. T. McKenzie, Philadelphia.—p. 683.

New York State Journal of Medicine

September, 1918, **18,** No. 9

75 Surgical Treatment of War Wounds. C. L. Gibson, New York. —p. 345.
76 Reception and Distribution of Cases in Casualty Clearing Station. E. W. N. Wooler.—p. 347.
77 Some Principles of Treatment of Gunshot Wounds. C. H. Upcott. —p. 350.
78 The Wilson Splint in Treatment of Gunshot Wounds of Humerus. —p. 354.
79 Control of Infection in War Wounds. W. Martin, New York. —p. 354.
80 Early Diagnosis of Intralaryngeal Carcinoma. D. B. Delavan, New York.—p. 360.
81 Surgical Treatment of Cancer of Larynx; Report of Cases. J. McCoy, New York.—p. 363.
82 Treatment of New Growths of Larynx by Internal Surgical Methods. H. Arrowsmith, Brooklyn.—p. 368.
83 Conservative Surgery of Chronic Intestinal Stasis. F. C. Yeomans, New York.—p. 374.
84 Estimation of Cardiac Strength and Importance of Conserving Energy During and Following Operations. R. R. Huggins, Pittsburgh.—p. 380.

Northwest Medicine, Seattle

September, 1918, **17,** No. 9

85 Some Suggestions Looking to Improvement of Public Health by General Practitioner. W. F. Smith, Boise, Idaho.—p. 255.
86 Washington State Medical Association. G. M. Horton, Seattle. —p. 259.
87 Neuropsychiatric Problems Encountered by Exemption and Advisory Boards of Interest to General Practitioners. W. House, Portland, Ore.—p. 262.

Oklahoma State Medical Association Journal, Muskogee

September, 1918, **11,** No. 9

88 Plea for More Careful Treatment of Gonorrhea. C. B. Taylor, Oklahoma City.—p. 281.
89 Acute Gonorrhea in Male. R. T. Edwards, Oklahoma City.—p. 284.
90 Prevention of Venereal Diseases. W. B. Pigg, Henryetta.—p. 291.
91 Symptoms and Diagnosis of Syphilis of Bladder; Report of Cases. W. J. Wallace, Oklahoma City.—p. 297.
92 Radium and Its Application in Surgery. E. S. Lain, Oklahoma City.—p. 299.

Public Health Journal, Toronto

September, 1918, **9,** No. 9

93 Medicosocial Service. J. J. Cameron.—p. 397.
94 Are We Ready for State Health Insurance? J. H. Mullin, Hamilton, Ont.—p. 402.
95 Child and Community. N. E. Mohr, Toronto.—p. 427.
96 School Nursing. W. Read, Halifax.—p. 431.

South Carolina Medical Association Journal, Greenville

September, 1918, **14,** No. 9

97 Some Aspects of Prostatic Surgery, with Special Reference to Methods of Popular Choice—Preoperative and Postoperative Treatment. E. P. Merritt, Atlanta, Ga.—p. 224.
98 Experience with Use of Mercury Intravenously. W. R. Barron, Columbia.—p. 226.
99 Gallbladder and Duct Surgery. R. L. Sanders, Memphis, Tenn. —p. 227.

Tennessee State Medical Association Journal, Nashville

September, 1918, **11,** No. 5

100 Eye Requirements for Aviators. R. Fagin, Memphis.—p. 177.
101 Case of Traumatic Stricture of Larynx. B. H. Wood, Nashville. —p. 179.
102 Treatment of Mastoid Disease. J. P. Crawford, Nashville.—p. 181.
103 Low Back Pains. A. G. Nichol, Nashville.—p. 185.
104 Program for Antituberculosis Work. H. H. Shoulders, Nashville.—p. 186.
105 *Complete Intestinal Obstruction from Carcinoma of Sigmoid and Rectum; Cases. W. D. Haggard and W. O. Floyd, Nashville. —p. 190.
106 Goiter. E. H. and J. P. Baird, Dyersburg.—p. 195.

105. Abstracted in THE JOURNAL, May 4, 1918, p. 1330.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

Archives of Radiology and Electrotherapy, London

September, 1918, **23,** No. 4

1 Sequestra in War Injuries. T. L. Bunting.—p. 105.
2 A New Roentgen Tube Centering Device. H. T. George.—p. 114.
3 A New Roentgen Tube Holder with Director for Ray of Normal Incidence. G. G. Campion.—p. 119.
4 Displacement of Auditory Ossicles Shown by Roentgen Rays. R. W. A. Salmond.—p. 125.

5 Mounting of Symington's Sectional Atlas of Neck, Thorax and Abdomen. A. E. Barclay.—p. 127.

British Medical Journal, London

Sept. 28, 1918, **2**, No. 3013

6 *Production of Meningococcus Anti-Endotoxin. M. H. Gordon. —p. 335.
7 Value of Roentgen Rays in Treatment of Malignant Diseases of Breast. C. Saberton.—p. 337.
8 *Gunshot Wounds of Knee Joint as seen at Base Hospital. H. H. Hepburn.—p. 338.
9 Some Aspects of Military Ophthalmology. S. H. McKee.—p. 340.
10 Case of Fatal Jaundice. R. A. Veale and B. H. Wedd.—p. 341.
11 Case of Successful Cesarean Section for Eclampsia. E. W. G. Masterman.—p. 342.
12 Treatment of Irritant Gas Poisoning. J. M. Lazenby.—p. 342.
13 *Administration of Anesthetics to Soldiers. A. Mills.—p. 343.

6. **Production of Meningococcus Anti-Endotoxin.**—Multivalent antimeningococcus serum that has given the best results in military cases has been found to be differentiated from serum of less therapeutic value by the fact that the former contains a demonstrable quantity of anti-endotoxins to each of the two commonest types of the meningococcus. Gordon found that anti-endotoxin is elaborated by the rabbit to both the commonest types of the meningococcus. In order to obtain anti-endotoxin, especially in the case of Type 1 meningococcus, it is absolutely essential to avoid over dosage. The antigens that appear to give best results in the rabbit are neither the raw coccus nor autolysates, but (1) a suspension of the dried coccus, and (2) the sensitized raw coccus.

8. **Gunshot Wounds of Knee Joint.**—Fifty consecutive cases of gunshot wound of the knee joint are summarized by Hepburn. He points out that this series does not include those cases in which the synovial membrane was not found to be penetrated, and at the same time commends the practice of early and complete excision of these nonpenetrating wounds, thereby preventing secondary infection of the joint in a large number of cases. It is a rare occurrence today at the base to find suppuration in a knee joint when the notes from a casualty clearing station say "Wound excised, not penetrating." Of the fifty cases under consideration, twenty-five were complicated by demonstrable bony lesion and twenty-five were not. The synovial cavity is stated to have been washed out and closed in twenty-seven cases—in fourteen cases with fracture and in thirteen without fracture. Saline solution is stated to have been employed in six cases, eusol in six, and ether in two. The remainder were not specified. Bipp was introduced into the joint in two cases and flavine in one; all three did well. The foreign bodies were not found, or not looked for, at the casualty clearing station in nine cases. Five of these required removal at the base. Of the remainder, one was left embedded in the femur, the other three being very small and the joints all quiescent.

It was found necessary to reopen the joint in nineteen cases out of fifty. Of these, twelve were cases with fracture, and seven without fracture. A partial arthrectomy was performed on one patient with extensive loss of the condyles of the femur. Subsequent amputation was necessary in six of the nineteen cases—four with and two without fracture. Of the latter, one was amputated for secondary hemorrhage from a separate wound. Two patients died from septicemia, one in each class. Both were suffering from other severe wounds in addition to those of the knee joint.

Repeated aspiration, with or without lavage through a cannula, has not, in Hepburn's hands, given results which warrant the delay in more complete drainage. It is now his custom to aspirate only once, and if the pathologist reports an active infection, to proceed with freer drainage should the accumulation of pus recur. He has found that suppuration occurs much more frequently in the anterior than the posterior portion of the synovial sac. Absolute immobilization, and evenly distributed support under the popliteal region, are extremely important points in the treatment. When pus does form in the popliteus bursa, thorough drainage is very difficult to obtain. The tendency is for the pus to track downward into the leg on the posterior interosseous membrane as well as upward along the femur, with a bad prognosis. Of the nineteen cases in this series which Hepburn drained by lateral incisions, seven developed an abscess in the posterior pouches. Six of these were treated by incision in the popliteal space, and one by an incision in front of the tendon of the adductor magnus. Four of these subsequently required amputation, and one of the four men died.

The offending organism in all cases reopened was the streptococcus, with or without *Staphylococcus albus*. Hepburn uses a small trocar or a spinal needle for aspiration.

He now uses the Thomas knee splint, with about 10 degrees of flexion, and without any extension. A foot support is essential. The postoperative treatment is—two hourly injection of half an ounce of eusol into each of the four Carrel tubes, with one thorough daily irrigation for three days. The tubes may be changed daily if they become blocked. At the third daily dressing the tubes are all removed and replaced by two tubes, which lie in the incisions but not within the synovial sac. On the fourth day the last through-and-through irrigation is given to remove any loose débris. From this time onward only superficial tubes and dressings are employed, and the incisions in the synovial sac encouraged to close. They are usually sealed up by lymph on the fifth or sixth day. If, as sometimes happens, pus collects in the popliteal region it must be dealt with. Movement of the joint must not be encouraged too early on account of the great danger of stirring up and liberating infection.

13. **Administration of Anesthetics to Soldiers.**—Mills advocates an ethyl chlorid-ether sequence as being the best method for induction, and has devised a method of using this sequence. A stopcock is fitted to the foot of the bag and this, connected by rubber tubing with an ether bottle and bellows, forms the simple apparatus which he uses in giving the ethyl chlorid-ether vapor sequence.

Journal of State Medicine, London

October, 1918, **26**, No. 10

14 Liverpool's Activities in Regard to Venereal Diseases. E. W. Hope.—p. 289.
15 Educational Propaganda in Relation to Venereal Diseases. C. J. Macalister.—p. 293.
16 Crismer Test for Detection of Foreign Fat in Butter, Lard, etc. A. W. Stewart.—p. 312.

Lancet, London

Sept. 28, 1918, **2**, No. 4961

17 Essential Characteristics of Successful and Unsuccessful Aviators. T. S. Rippon and E. G. Manuel.—p. 411.
18 Chronic Intestinal Stasis. W. A. Lane.—p. 416.
19 Diagnosis and Treatment of Malaria. D. G. Marshall.—p. 417.
20 *Symptomatology and Morbid Anatomy of So-Called "Spanish Influenza." E. R. Hunt.—p. 419.
21 Case of Loose Body in Knee Joint. P. B. Roth.—p. 421.
22 Meningitis Caused by Micrococcus Flavus. J. H. Teacher and A. M. Kennedy.—p. 422.
23 Cases of Cerebrospinal Fever. J. A. Glover.—p. 422.

20. **Morbid Anatomy of So-Called "Spanish Influenza."**—Hunt says that a blood count is of great value in helping to discriminate between the various causes of P. U. O. (pyrexia of unknown origin). The trench fevers are usually accompanied by a moderate leukocytosis. Malaria, malignant endocarditis, scarlet fever, and cerebrospinal fever, as a rule, show a marked leukocytosis. The enteric group is more usually characterized by a leukopenia. In "Spanish influenza" the leukocyte count usually varies between 5,000 and 9,000 per c.mm. Very few cases of influenza show a true relapse, and the occurrence of pyrexia relapsing within a few days in a supposed case of influenza suggests the probability of the case being one of trench fever.

Quarterly Journal of Medicine, Oxford

July, 1918, **11**, No. 44

24 Calcium Content of Blood in Infantile Tetany; Effect of Treatment by Calcium. J. Howland and W. McK. Marriott, Baltimore.—p. 289.
25 *Deficiency Theory of Origin of Beriberi; Report of Forty Cases. F. M. R. Walshe.—p. 320.
26 *Arterial and Venous Blood Pressures in Enteric Group of Fevers. H. F. Marris.—p. 339.
27 Dysentery in Mediterranean Expeditionary Force. P. Bahr and J. G. Willmore.—p. 349.

28 Symptoms of Trench Fever. H. Drummond.—p. 363.
29 *Hematology of Trench Fever. H. W. Perkins and R. H. Urwick. —p. 374.

25. **Deficiency Theory of Origin of Beriberi.**—From their clinical aspect and on the grounds of their etiology the forty cases described by Walshe may be regarded as true beriberi. There is no evidence in support of a recently expressed view that this, or similar outbreaks of the disease described as occurring among troops, bears any relation to epidemic jaundice and is of the nature of an infection. A consideration of the deficiency theory of the origin of beriberi in the light of recent clinical and experimental work makes it clear that the present hypothesis, which postulates a single negative factor, namely, the absence of a specific accessory food factor or vitamin, is inadequate. It conflicts with the results obtained in starvation experiments on fowls. Starved fowls live sufficiently long to develop the disease under such conditions, yet they die without developing it, although in this essential respect, namely, the deprivation of vitamins, starvation is the equivalent of an avitaminic diet.

It is apparent from all recent experimental work, both in man and poultry, that there are two factors in the production of beriberi: (1) the absence of an accessory food factor or vitamin; (2) the use of certain foods which are the direct and immediate cause of the disease. There is a considerable weight of evidence to prove that carbohydrates constitute this second direct and immediate factor. It seems probable that in the absence of their specific vitamin they undergo an aberrant hydrolysis with the production of toxic by-products, or end-products, thus producing beriberi. Viewed in this light the disease is an intoxication.

From another point of view it may be questioned whether the clinical and pathologic characters of the disease are compatible with the theory that it is a slowly progressive diffuse degeneration of the nervous system. The striking symptoms of beriberi and the widespread visceral and nervous changes seen postmortem cannot be accounted for by such an hypothesis. Finally, it seems certain that until the physical chemistry of the vitamins and the metabolism in beriberi—both totally unexplored fields—have been more fully investigated, the pathogenesis of beriberi will remain in part obscure. All the genesis of the disease may be best expressed by saying that the use of certain foodstuffs, probably carbohydrates, in the absence of their accessory food factors or vitamins, directly causes beriberi.

26. **Blood Pressures in Enteric Group of Fevers.**—Marris was stimulated to make this investigation by an observation made during the last half hour of life in a case of typhoid. The heart was failing rapidly, and while the patient was actually under examination the superficial veins all over the body were observed to swell up and stand out like whipcords. On performing venesection with a view to relieving the right side of the heart, the blood gushed out, showing a pressure obviously excessive. Marris then decided to devise some simple means by which the venous pressure could be recorded. Low systolic pressures were constantly observed in severe cases of the enteric group of fevers and a very close approximation of the systolic to the diastolic pressures in the fatal cases.

Observations were made on the arterial and venous pressures in cases of the enteric group in which thrombosis was present. Exceptionally high readings were found in all such cases, and the pressure was observed to fall with the subsidence of the condition. Inoculation against the enteric group produces a temporary fall in the arterial pressure similar to that seen during an infection by each or any member of the group. The conclusion is inevitable that not only are the living organisms capable of affecting the blood pressure, but that a sterile emulsion of the same, such as is used in inoculation, will also bring about a similar result: therefore, this effect must be produced by some toxins in the bacilli. The arterial pressure in man is dependent on the following factors: (1) the systole of the left ventricle; (2) the elastic recoil of the arteries; the viscosity of the blood may also be a factor.

29. **Hematology of Trench Fever.**—Perkins and Urwick failed to find any appearance in blood films which is characteristic of the disease. A single enumeration and differentiation of the leukocytes is often of value as a means of diagnosis from enteric fever, but cannot afford any reliable evidence that the disease present is trench fever. Repeated counts carried on through the various phases of the disease produce a composite picture which, though not without exceptions, is so constant that it may be considered characteristic. It consists in the combination of the following features: (*a*) A marked rise of leukocytes of all three kinds (polymorphs, lymphocytes and large mononuclears) at the time of a febrile relapse. (*b*) A gradual relative rise in the lymphocytes during the period of convalescence.

Archives Médicales Belges, Paris

September, 1918, **71**, No. 9

30 *Cylindroma. H. Le Long and C. Sterckmans.—p. 265.
31 *Cells and Bacteria in Wounds. M. le F. de Arric.—p. 274.
32 *Paralysis of Brachial Plexus. M. van de Maele.—p. 282.

30. **Cylindroma.**—The tumor the size of a hen's egg was removed from the upper jaw of a young soldier, and there has been no sign of recurrence during the three months to date. In sixty-four of the eighty-three cases on record to date, the cylindroma started near the orbit.

31. **Relations Between Cells and Bacteria in Wounds.**—De Arric reports the average findings in 500 wounds of bones and muscles that had been treated by the Carrel method. The numbers of mononuclears seem to increase as the bacteria disappear, and this inverse proportion fluctuates with the bacterial content of the wound, usually immediately, but sometimes not until after twenty-four hours. Sometimes the streptococci seem to have disappeared from the wound when in fact they are lurking in its hidden recesses. This is revealed by the lack of the usual rise of mononuclears as the bacterial count grows less. When the mononuclears keep persistently at a low figure, this should warn of possible streptococcus infection. Tracings of the average cell count and bacteria count in 100 cases show the mononuclears close to or below 10 per cent., as a rule, in the streptococcus cases. Such cases usually run a long torpid course, but finally the number of mononuclears begins to rise; when this occurs, the bacteria will be found disappearing, or their virulence is declining. De Arric is chief of the bacteriologic laboratory of a Belgian military hospital, and all his experience tends to demonstrate the close relation between the cell count and the qualitative element of the infection.

32. **Paralysis of Brachial Plexus.**—Van de Maele relates the different criteria for locating with precision the various forms of paralysis of the brachial plexus resulting from involvement of the trunk nerves of the neck or axilla, the roots, etc. Some cases are described which illustrate the means for distinguishing between paralysis of radicular origin and monoplegia of cerebral, spinal or hysteric origin.

Bulletin de l'Académie de Médecine, Paris

Aug. 20, 1918, **80**, No. 33

33 *Genital Prolapse. S. Mercadé.—p. 169.
34 *Epitheliomatosis in Workers on Tar. G. Thibierge.—p. 173.
35 *Enlarged Medicolegal Photographs. E. Martin.—p. 181.

Aug. 27, 1918, **80**, No. 34

36 *The Spinal Fluid in Typhus. A. Devaux.—p. 188.
37 Prehistoric Testimony to Triple Origin of Human Incisors. M. Baudouin.—p. 189.
38 Influenza in Evacuation Hospital. Dugrais and Lemaire.—p. 191.

33. **Genital Prolapse.**—This is a committee report on Mercadé's method of correcting genital prolapse by suturing in front of the vagina the muscles which sustain the urogenital floor. The committee endorsed the method as a good one for total prolapse and as the best and most effectual operation for isolated cystocele, both mild and grave. Mercadé emphasizes that it is the anterior wall of the vagina which sags first. The bladder is the first organ to be pulled out of place. By arresting this tendency on the part of the bladder, the whole prolapse is checked. This can be accomplished by fastening the anterior cords of the erector muscles

to the muscles of the urogenital floor. This reenforces the floor and renders it solid and resistant. Separating the bladder from the vagina and the uterus requires minute care. The back and sides of the bladder are detached and the lips of the vaginal incision. The erector muscles are then sutured together on the median line, thus forming a strong floor for the bladder. The urogenital floor is then sutured together below and then the vaginal incision. This method has been applied in six cases of extreme prolapse, and all were radically cured. The interval since has been only a few months but the resistance opposed by the region to abdominal straining guarantees a definite cure. The deep sutures are made with chromicized catgut. There is no need for tamponing the vagina or checking defecation.

34. **Multiple Disseminated Epitheliomatosis in Workers on Tar.**—Thibierge describes the peculiar dermatosis which develops when the openings of the glands in the skin become obstructed by tar, asphalt or similar substance clogging the pores.

35. **Enlarged Photographs in Forensic Medicine.**—Martin is professor of legal medicine at the University of Lyons, and he here expatiates on the valuable information often to be derived from enlarging a photograph of a firearm wound in criminal cases. The stereoscopic view, enlarged several diameters, brings out details which entirely escape notice under other conditions, or are beyond the pale of the human senses otherwise.

36. **Cerebrospinal Fluid in Typhus.**—Devaux asserts, on the basis of 200 cases, that typhus infection is more decidedly neurotropic than in any other infectious disease. The diffusion and gravity of the lesions in the central nervous system are in marked contrast to the relative integrity of the other organs. The cerebrospinal fluid shows a leukocyte reaction early and constantly, and it is progressive and persists for from two to eight months. During the first week the field shows ten or twelve large lymphocytes, four or five mononuclears, and one polymorphonuclear to every two or three fields. This cytologic picture grows graver for two or three weeks.

Bulletins de la Société Médicale des Hôpitaux, Paris

June 14, 1918, **42**, No. 21

39 Brain Tumor with Cerebral Fluid Draining through Sphenoidal Sinus into Nose. A. Souques.—p. 599.
40 Tardy Epilepsy after Mumps. L.-Lavastine and V. Ballet.—p. 604.
41 *Cerebrospinal Fluid in Sciatica. Sicard and Roger.—p. 611.
42 Abortive Adenolipomatosis. Babonneix and David.—p. 613.
43 Rat-Bite Fever. S. Costa and J. Troisier.—p. 616.

41. **The Spinal Fluid with Sciatica.**—Sicard and Roger warn that every case of persisting sciatica calls for examination of the lumbar puncture fluid. High albumin or cell content or positive Wassermann gives the clue to proper treatment, showing that the case is not one of ordinary medical sciatica.

Paris Médical

July 27, 1918, **8**, No. 30

44 *Heliotherapy of War Wounds. G. Léo and F. Vaucher.—p. 65.
45 *Diagnosis of Contagious Lesions of Syphilis. Quioc.—p. 73.
46 Oscillometer Localization of Cardiac Murmurs. A. Lévy.—p. 74.

44. **Local Heliotherapy for War Wounds.**—Léo and Vaucher report experiences which show that bacteriologic and histologic research confirms the clinical benefit from local sun baths of war wounds. The microscope discloses the rapid disappearance from the wound of the anaerobic bacteria and then of the aerobic. The profuse exudation of lymph is not bactericidal, but its high antitryptic power neutralizes the fermentation activity of the bacteria and leukocytes. Nothing else, except hot air, induces such an incessant afflux of fresh serum. Phagocytosis does not seem to be activated, at least on the surface. After a certain number of hours of insolation, the wound becomes practically sterile. They declare in conclusion that this effect is realized more rapidly by insolation than by any other therapeutic measure, not even excepting hypochlorite solutions. They reiterate that in all climates and at all seasons, when the sun is shining, it emits rays with a positive therapeutic value. Not to utilize them is a waste, greatly to the detriment of the wounded on whose beds the sunlight falls. The dressing should be opened to expose the wound and the window should be opened, as glass arrests part of the useful chemical rays, but coarse wire screening is necessary to keep flies away from the wound. They do not think it necessary to protect the wound against dust. The exposures are for fifteen minutes to a maximum of two hours. The sunlight acts like a drain, the edematous tissues around the wound pouring out the septic fluid in them, the droplets becoming visible to the naked eye in about ten minutes, and always by the fifteenth or twentieth. They tell the patient, "Put your wound there, in the sunshine, and watch how soon it will begin to ooze and the pain go down." They expose the whole limb when possible, or the region of the body involved.

45. **Simplified Technic for Determination of Pale Spirochete.**—Quioc expatiates on the superior and unfailing advantages of the Fontana-Tribondeau technic in the early or late differential diagnosis of syphilis. The organic débris and red corpuscles are partially dissolved while the pale spirochete is shown up clearly and distinct from other spirochetes.

(1) Dissolve cold 1 gm. silver nitrate crystals in 20 c.c. of distilled water. Reserve part of the solution, and add to the rest ammonia, a little at a time, stirring constantly, until a sepia precipitate is thrown down and then disappears anew. The reserved solution is then added, fractioned, until there is slight turbidity, persisting during agitation. This reagent, sheltered from light, keeps well. Dry the specimen carefully, and cover it for thirty seconds, two or three times, according to its thickness, with Ruge's solution: 1 c.c. of crystallized acetic acid in 100 c.c. of a 2 per cent. solution of formaldehyd. The hemoglobin dissolves. Rinse in alcohol; pass through flame to burn off all traces of alcohol. Cover the specimen with a solution of tannin: 5 gm. of tannin and 1 gm. of glacial phenol in 100 gm. water. Heat till it steams. Let it steam for a minute, then rinse till all trace of the tannin solution is gone. Then dry. Cover with the nitrate solution. Rinse and dry. All the spirochetes take an even deposit of the silver, and look uniformly thicker and extremely distinct. The pale spirochete retains all its special characteristics, showing up dark purple against a transparent background or against the light yellow background of the decolored reds.

Presse Médicale, Paris

Sept. 5, 1918, **26**, No. 49

47 *Meningeal Hemorrhages in War Pathology. G. Guillain.—p. 449.
48 Traumatisms of the Tarsus. F. Masmonteil.—p. 450.
49 *Treatment of Chronic Osteomyelitis. G. Jean.—p. 452.

Sept. 9, 1918, **26**, No. 50

50 *Syphilis of Nervous System. Sicard and Roger.—p. 457.
51 *Colectomy. V. Pauchet.—p. 459.
52 *Serotherapy for Gas Gangrene. Mairesse and Régnier.—p. 461.
53 *Glycuronuria. R. Porak and Texier.—p. 462.
54 *Changes in Blood with General Anesthesia. L. Binet.—p. 463.

Sept. 12, 1918, **26**, No. 51

55 *Treatment of Tetanus. L. Bérard and A. Lumière.—p. 469.
56 Mitral Stenosis and Raynaud's Disease. J. Chalier.—p. 471.
57 *Natural Colorimetric Scale for Wassermann Test. A. Bergeson and E. Normand.—p. 472.

47. **Meningeal Hemorrhages in War Pathology.**—Guillain declares that meningeal hemorrhages play a surprisingly important part in war pathology, especially with skull wounds, and in aviators making a dangerously sudden landing or a fall. If lumbar puncture is not done, the meningeal hemorrhage may escape detection, or symptoms later may retrospectively reveal it. With shell concussion, besides the meningeal hemorrhage there may be bleeding from lungs, nose or stomach. Signs of meningeal hemorrhage include cerebral excitement, with mental confusion, exaggerated tendon reflexes, with bilateral clonus and Babinski, certain contralateral reflexes, and defense reflexes like those in the frog, pupil disturbances such as mydriasis, uneven pupil reactions, disturbance in reaction to light, and massive albuminuria. In some cases, a jaundice tint suggested meningeal hemorrhage even before the lumbar puncture confirmed the assumption. In a number of cases of meningeal hemorrhages, there was an excessively high temperature for several days. This was not due to infection but to some nervous disturbance in the heat production, probably from toxic action by the products generated in the extravasated blood. General anesthesia dilates the vessels and tends to exaggerate the hemorrhage if much of the spinal fluid is withdrawn. Done properly, lumbar puncture has a decided therapeutic value.

49. **Treatment of Chronic Osteomyelitis.**—Jean denounces rough handling of the bone, saying that the gouge and chisel are liable to cause remote fissures or at least to deaden the bone tissue and favor production of infection and thrombosis. It is much better to work with an electric drill. When the drill touches a sequester it does not cut into it, but the ear hears the difference in the sound and the hand perceives the contact. Provisional hemostasis is indispensable, and the whole of the bone must be examined. The roentgen negatives taken from front and side must be constantly under the eyes of the operator; roentgenoscopy is not enough to disclose the finer lesions of the osteitis. A head mirror is also indispensable. Curetting is a blind procedure, liable to inoculate sound tissue while neglecting diseased points. He makes no attempt to fill up the cavity, but lines it with the skin loosened up around and drawn down into the cavity and fastened there, then applying a compressing bandage, before arresting the provisional hemostasis. This dressing is removed the fourth or fifth day. If there is still slight infection, he irrigates with Dakin's solution and completes the cure with heliotherapy. If the skin cannot be drawn down to cover the cavity completely, he fills the gap with Reverdin grafts, toward the end of the second week, recommencing a week later the exposures to the sunlight which stimulate the vitality of the grafts while continuing the magic effect on the bone lesion and the general condition. By this technic the skin cicatrix is perfect, it is supple and painless. Healing is certain and rapid although the results of this deep cutaneization of the bone, as he calls it, are not esthetic.

50. **Syphilis of Nervous System.**—Sicard and Roger declare that a negative Bordet-Wassermann test of the cerebrospinal fluid excludes general paralysis in dubious cases. This test persists irreducibly positive in general paralysis. In tabes it may veer to negative, and we may be able to modify favorably the course of tabes by intensive treatment. The lymphocytosis and albumin are far less reliable as a basis for the diagnosis. Their experience has confirmed that general paralysis is a special form of meningocerebral syphilis, while tabes belongs in meningomedullary syphilis. The most daring treatments have been given thorough trials in general paralysis, but all to no avail. They have pushed specific treatment to the extremest limits, but without modifying the disease. In one of the cases they describe they gave an intravenous injection of 1.5 gm. neo-arsphenamin, under chloroform anesthesia, followed by a lumbar intraspinal injection of saline or horse serum. The whole procedure, including the chloroform anesthesia, was repeated weekly for two months. The patient bore it well, but the disease showed no improvement.

51. **Colectomy.**—Pauchet relates that further experience is confirming the superior advantages of his aseptic technic for removal of the right colon for obstipation, tuberculosis or cancer. Seven illustrations show the various phases of the intervention.

52. **Serotherapy of Gangrene in the Wounded.**—Mairesse and Régnier write from the automobile surgical Ambulance No. 1 that they have examined bacteriologically 1,016 wounded in a recent three months. Swabs were taken from the deepest part of the wound, the moment the wounded were brought in. Then in fifteen minutes the surgeon was supplied with the bacteriologic balance-sheet for each man, showing not only the microbian flora but the cytologic reaction. They found bacteria of the perfringens type (gas bacilli) present in 297, including twenty-five with sporulated bacilli. All these perfringens wounded were given a prophylactic injection of antiperfringens serum. Of the total 297 anaerobic cases, twenty-five developed gas gangrene. During the early tentative phase of the serotherapy, three of those affected died, but all the others recovered under continued serotherapy, including three exceptionally severe cases. They warn that under the preventive serotherapy, if gangrene develops it has no gas or odor, and the muscles look pink—all tending to lull the surgeon into a false sense of security, unless the case is kept under bacteriologic control. Prompt bacteriologic examination discloses at once the more dangerously infected cases, and these can be given precedence in operating.

53. **Glycuronuria.**—Porak and Texier comment on the instructive oversight of liver functioning afforded by reduction in the glycuronuria, as one of the earliest signs of hepatic incompetency.

54. **Changes in Blood During General Anesthesia.**—Binet compares the publications on this subject in the last few years. They have demonstrated as the most important modifications under the influence of chloroform or ether, a reduction in the activity of the corpuscles, in the coagulability, and also a reduction in the oxidizing power.

55. **Tetanus.**—Bérard and Lumière are in charge of the central service at Lyons for the wounded with tetanus. From 28, 25 and 41 cases during the first years of the war, they had only 15 in 1917, and 3 in 1918, until last month when 4 cases reached them. The clinical picture in their 116 cases, they say, was never twice the same, but all required minute revision of the wounds to clear out débris, etc., with neutralization of the toxins, and treatment of the symptoms as they arose. The wound, the source of the toxin production, may be some minute contused injury of the foot or hand, possibly overlooked entirely. The focus must be widely opened up, curetted and disinfected with oxidizing agents. Crystals of sodium persulphate scattered in the wound were found more useful than hydrogen peroxid solutions, as the action from the crystals kept up longer. Rubber drains must be freely used, and the dressing changed every day. In 26 cases the focus wound had not been disinfected at all, and 19 of this group died. The total mortality, including these cases, was 50 per cent. The protection conferred by the preventive injection rapidly declines, and cannot be counted on for more than two weeks. In 2 of the total 116 cases the production of toxins was evidently so intense that even two injections of the antitoxin, at a week's interval, failed to saturate it. In all the other cases, the 10 or 20 c.c. dose seemed to be ample. When the first symptoms of tetanus appear, they give 30 c.c. of the antiserum daily for three days. When not absolutely certain that all the tetanus bacilli have been cleared out of the wound, they keep up these injections longer.

In symptomatic treatment, the most active and the least dangerous remedy they have found is sodium persulphate. It keeps well, in dry form, in sealed tubes. When ready to use, 5 gm. are dissolved, cold, in 100 c.c. of sterilized distilled water, and 20 c.c. of this is injected into a vein in the bend of the elbow, morning and night, for three days or longer. In about half the cases there is brief vomiting immediately after the injection, so the patient should not eat just before. The spasms usually cease at once after the injection, but may return a few hours later, but often they subside completely after the second or third injection. They have never had any mishaps with it, even under protracted administration. The patient becomes less sensitive to external stimuli, he lies sometimes absolutely calm, free from pain. The relief even for a few hours is a great boon. It is sometimes useful to supplement the action of the persulphate with chloral or other sedative.

The permanent contracture is not appreciably modified by the persulphate. When the contracture affects the muscles of respiration, nothing has been proposed to date that is effectual against this except Sauerbruch's suggestion of bilateral phrenicotomy plus artificial respiration. He has reported several successful cases. Bérard and Lumière believe that the same results might be realized by mere local anesthesia of the phrenic nerves, blocking it with some anesthetic. They have had occasion only once to apply this method, but the success was prompt and complete, respiration becoming normal, the cyanosis, agitation and suffocation disappearing, and the man dropped into tranquil sleep. They injected 10 c.c. of a 1 or 2 per cent. solution of procain, with a little epinephrin, introducing the needle at the posterior margin of the sternocleidomastoid, 2 cm. above the supraclavicular fossa, the tip pointing toward the median line. The needle is gently pushed in for 3 cm. until it encounters a little stronger resistance, showing that it has reached the anterior scalenus. Then the fluid is injected. Local and regional anesthesia in this way will arrest permanent con-

tracture of the limbs in tetanus, and ward off vicious consolidation of fractures in the wounded with tetanus, while shortening the period of functional impotence with partial tetanus. If constipation persists in spite of the above measures, the bowels and sphincters may be relaxed by spinal anesthesia and contracture around the wound relieved by regional anesthesia.

In conclusion they report an instructive case in an American soldier with a scrap of shell in the right scapula region. The projectile was not found at the primary operation, and it seemed to be healing harmlessly in place when, after a month, contracture was noticed in that arm and pain in the muscles of the shoulder and neck. Massage and passive movements were applied but, the symptoms growing worse, the young man was sent to the tetanus service. At once the projectile and sequesters were sought and removed, and the tetanus bacillus was cultivated from them. This patient's condition is still precarious. He was wounded July 15, and was given two antitetanus injections. The first hint of contracture came August 8, but the projectile was not removed till August 20. At the first hint of contracture, the wound should have been cleared out of all foreign bodies. During the twelve day interval the toxins had been elaborated without check.

57. **Colorimetric Scale for Wassermann Reaction.**—Bergeron and Normand extol the advantages of having an additional set of ten tubes for comparison and percentages of the gradation of tints in the Wassermann reaction. The supplementary set of tubes contain varying dilutions in physiologic saline of a 20 per cent. dilution of the original 10 per cent. dilution of 0.2 c.c. of sheep or human red corpuscles. Comparison between the findings of different workers and different laboratories is thus made possible and reliable.

Progrès Médical, Paris

August 3, 1918, **33**, No. 31

58 *Commotion of Spinal Cord. G. Roussy and L. Cornil.—p. 263.
59 Chlorination of Water. P. O. Collins and A. Bernard.—p. 265.
60 Morbid Courage. P. Voivenel.—p. 266.

August 10, 1918, **33**, No. 32

61 Valvular Disease and Fitness for Service. Clerc and Aimé.—p. 271.
62 Chloramin-T in Disinfection of Wounds. Aimes and Sari.—p. 273

August 17, 1918, **33**, No. 33

63 *Artificial Arms and Hands. C. Roederer.—p. 279.
64 Congenital Absence of Right Diaphragm. L. Moreau.—p. 281.
65 *Suicidal Forms of Psychoses. H. Damaye.—p. 284.

58. **Paralysis from Concussion of Spinal Cord.**—Roussy and Cornil analyze five cases, representing different types, to illustrate the necessity for reserving the prognosis at the first examination. Cases apparently of the gravest nature may prove to be the result of merely temporary suspension of function, and gradual recuperation follows. Systematic immobilization, refraining from any operation on the spine, care to ward off bedsores and complications on the part of the lungs, will often lead to a favorable outcome in cases of quadriplegia from concussion of the spinal cord. In three of the cases described signs of return of motor function were detected between the twentieth and twenty-fourth day. The concussion was by contre-coup or indirect contusion. In the two cases with direct contusion of the cord and dislocation of a vertebra, the interval was two and four months. These two men, ten and fourteen months after the wound, present merely simple hemiparesis or traces of hemiplegia, with the Claude-Bernard Horner syndrome. In the ten months case the sphincter and genital derangement still persist.

63. **Working Hands.**—Roederer reviews the present tendencies in the manufacture of artificial hands, simplification of all parts, especially the shoulder piece, buckling instead of lacing, abandonment of the "universal prosthesis," specialization to the extremest limits in the terminal portion, and discrimination between the *prothèse de forme* and the *prothèse de force*. At the Lyons training school for the disabled, 75 per cent. of the 286 farmers among the 637 one-armed men have returned to agricultural work. Of the 175 factory workers, 15 per cent. had resumed their former trade, and 29 per cent. a similar trade; 9 per cent. had taken up agricultural work.

65. **Suicidal Mental Derangement.**—Damaye relates that among the 916 men who have passed through the advanced neuropsychiatric center, there were thirty-three who had tried to commit suicide. In fifteen of the thirty-three, there were evidences of heart disease, with traces of albumin, as also in seven with melancholia but no attempts at suicide. The tendency to mental derangement was most often manifested in the man's deserting. Malaria plus abuse of alcohol was found in the large majority of these cases. Many of these men are peculiarly susceptible to liquor so that even one glass of wine upsets their balance, and fatigue enhances this susceptibility. Brief summaries are given of each of the suicide cases. The treatment applied to all aimed at disintoxication and reconstitution: iodin, cacodylate, morphin, and daily baths at 37 or 40 C. (104 F.) for half an hour or an hour.

Annali d'Igiene, Rome

July, 1918, **28**, No. 7

66 Biologic and Immunizing Properties of Bacilli of Colon and Typhoid Group. G. Galeotti.—p. 341.
67 Deficient Diets and Disease. G. Volpino.—p. 346. Cont'n.
68 *Berberin in Treatment of Malaria. A. Ilvento.—p. 358.
69 *Treatment of Lymphosporidiosis. G. Alessandrini.—p. 364.

68. **Berberin in Treatment of Malaria.**—Ilvento urges trial on a large scale of decoctions of barbery which is an old household remedy for malaria in Italy. Used in conjunction with quinin, it has given him better results than was obtained with the latter alone.

69. **Tartar Emetic in Treatment of Sporidiosis in Horses.**—Alessandrini reports the cure of over 89 per cent. of 105 horses with cryptococcus farcy (lymphosporidiosis) given intravenous injections of tartar emetic. It also displayed preventive action when the lesions were washed with it and the "buttons" opened. Flies disseminate the germs and may infect sound animals when they alight close to the eyes and nostrils or on excoriations. The flies that get any of the tartar emetic from the lesions or otherwise die promptly. Even in a very weak, sweetened solution it soon kills them.

Chirurgia degli Organi di Movimento, Bologna

August, 1918, **2**, No. 3-4

70 G. Mercuriale, 1530-1606.—p. 259.
71 *Cervical Ribs. I. Scalone.—p. 275.
72 Astragaloscaphoid Dislocation of the Foot. F. Niosi.—p. 307.
73 *Protection of Wounded Nerve. A. Corti.—p. 323.
74 Contracture of Fingers in Dorsal Flexion. U. Pasini.—p. 367.
75 War Pseudocatatonia. V. Neri.—p. 374.
76 Talipes Varus after War Wound. F. Nassetti.—p. 409.
77 *Skin Tunnel for Kinetic Plastics. F. Delitala.—p. 411.
78 Prostheses with Kinetic Plastics. Landini and Cevolani.—p. 417.

71. **Cervical Ribs.**—Scalone reviews the present status of our knowledge of cervical ribs, the differential diagnosis of disturbances from them, and the best mode of treatment. In a personal case described, almost the entire supernumerary rib was resected through a short incision close to the base of the neck at the side. The rib was cut and removed in two parts. The patient was a young soldier, and the cervical rib was adherent to the first regular rib. There had been no disturbance from the unsuspected cervical rib until within the last few months.

73. **Operations on Nerves.**—Corti discusses the various procedures that have been devised to protect the nerve after an operation on it, and describes personal research which has apparently demonstrated that an artery from a dog can serve to protect a wounded nerve and it resists absorption for a long time. In three clinical cases it was found in good condition after 225, 194 and 305 days. Veins are less resistant than arteries for the purpose. The sheet of arterial tissue wrapped around the nerve protects it from invasion by surrounding tissue.

77. **Kinetic Plastics.**—Delitala's photographs show the simple technic for cutting a bridge flap, rolling the sides up to form a tunnel, and then looping around the outside of the tube thus formed the tendons of the chief muscles. The distal ends of the tendons are brought up and each is looped around the belly of the respective muscle, and fastened with

a few stitches. The skin is then sutured over the whole. The handle of an instrument, passed through the tunnel thus formed, can then be moved by volitional impulse from those muscles.

Policlinico, Rome

Sept. 1, 1918, **25**, No. 35

79 Tuberculosis in Soldiers. A. Brungnatelli.—p. 821.
80 *Xiphoid Crepitation in Typhoid. F. Bergolli.—p. 823.
81 *Prophylaxis of Malaria. D. Albano.—p. 826.

80. **Xiphoid Crepitation in Typhoid.**—Bergolli reports twelve cases of typhoid in which Galvagni's sign—xiphoid crepitation—was pronounced. Some were acute cases and the liver was generally enlarged, and there were usually symptoms of a reaction on the part of the peritoneum. In all the cases the epigastrium bulged above the level of the xiphoid. The seat of the crepitation is undoubtedly the subcutaneous cellular tissue, and disturbances in the circulation of lymph seem to be the cause.

81. **Prophylaxis of Malaria.**—Albano relates that mosquitoes will not bite where the skin is smeared with petrolatum. He smears all the exposed skin with petrolatum once every day or two, and says that this permits tranquil sleep amid myriads of mosquitoes.

Rivista Critica di Clinica Medica, Florence

Aug. 10, 1918, **19**, No. 32

82 Factitious Edema. G. Garin.—p. 373.

Archivos Latino-Americanos de Pediatria, Buenos Aires

Jan.-Feb., 1918, **12**, No. 1

83 *Serotherapy of Poliomyelitis. M. Acuña and Casaubon.—p. 1.
84 *Stones in Child's Kidney. N. Gurgel.—p. 16.
85 Diphtheria in Three Days' Child. A. F. Puyol.—p. 21.
86 Rheumatismal Mitral and Aortic Insufficiency in Girl of Eight. A. A. Ugon.—p. 28.
87 Rheumatismal Asystoly in Girl of Five. M. F. Langon.—p. 32.
88 *Scurvy in Infant. J. A. Baura.—p. 40.
89 *Mumps Meningitis. V. Zerbino.—p. 44.
90 *Secondary Pneumococcus Meningitis. L. Solari.—p. 50.
91 *Pneumonia in Twenty-Five Days' Infant. M. A. Ugon.—p. 54.
92 Protection of Children against Tuberculosis. A. Alfaro and V. Blanco.—p. 57.

83. **Serotherapy of Poliomyelitis.**—Acuña and Casaubon report four cases of poliomyelitis in which convalescents' serum was used in treatment. They expatiate on the logical and promising outlook for this form of treatment although their own cases were disappointing, as the disease was in an advanced phase in all, paralysis having been observed for five or seven days before. Four days seems to be the limit and the more recent the convalescence in the donor the more effectual the serum although instances are known of effectual action even after a thirty-two years' interval. In their four cases the intraspinal injection of the serum was borne without apparently the slightest inconvenience. The infants were from 7 to 20 months old, and the amounts injected ranged from 2 to 6 c.c. at a time, to a total of from 7.5 to 38 c.c. The interval since the convalescence had been three, five and eight years and two months.

84. **Kidney Colics in Child.**—The boy of 6 had suffered for three years from colic pains, finally explained by roentgen discovery of two concretions in the pelvis of the left kidney. There never had been any hematuria, pyuria or albuminuria, and the general health was excellent throughout.

88. **Infantile Scorbutus.**—The child was about a year old, and it had been fed almost exclusively for weeks with boiled milk and arrowroot flour.

89. **Mumps Meningitis.**—Zerbino's patient was a boy of 13, and the diagnosis when he entered the hospital had been tuberculous meningitis. After he had been feeling sick for two weeks and lumbar puncture had showed 384 cells per millimeter, including 99 per cent. lymphocytes, he began to improve. A history of mild mumps two weeks before was then elicited. In some cases cited, the meningitis was the first manifesation of the disease.

90. **Pneumococcus Meningitis.**—The boy of 3 had recovered from bronchopneumonia when, a month later, he developed fatal pneumococcus meningitis.

91. **Pneumonia in Infant.**—The nursling was only 18 days old when it developed pneumonia, with defervescence the ninth day and complete recovery, after a brief tardy partial bronchopneumonia in the base of the same lung. Treatment had been with hot baths and 1 c.c. of 5 per cent. camphorated oil.

Cronica Medica, Lima

August, 1918, **35**, No. 662

93 Exophthalmic Goiter in Girl of Sixteen. E. Odriozola.—p. 219.
94 *Treatment of Varicocele. H. H. Torres.—p. 225.
95 Preparation of Sodium Hypobromite. M. A. Velasquez.—p. 235.

94. **Conservative Treatment of Varicocele.**—Torres reports highly favorable results in fourteen cases in which he applied del Valle's conservative method of curing varicocele. He separates the spermatic veins into two bunches and passes a silk ligature around part of the veins in each bunch. The long ends of the silk are then drawn up through an incision in the aponeurosis, 4 cm. long, made 2 cm. inside of the internal pillar. The veins thus drawn up through the aponeurosis are held there while the incision in the aponeurosis is sutured beneath them, except at the corners. These veins thus run over a bridge, materially shortening their extent below, and sustaining the testicle at the proper height, while the circulation is modified to prevent further tendency to varicocele, without a cutting operation. Several illustrations show the details of the technic.

Cronica Medico-Quirurgica, Havana

May, 1918, **44**, No. 5

96 Extreme Photophobia. J. S. Fernandez.—p. 256.
97 *Foreign Body in Intestine. R. de Castro.—p. 265.
98 Irregular Pyrexias in Cuba. A. Silvera.—p. 272.
99 Sneezing: Spontaneous and Induced. V. de Castro.—p. 276.

97. **Disturbance from Foreign Body in Intestine.**—Intense pain in the appendix region, with tenderness at McBurney's point, were the only symptoms. They kept up for three days and then subsided for six years, when the pain returned with agonizing intensity, until the tooth of a comb was passed in the stools. This cleared up the puzzling diagnosis and all the disturbances at one stroke.

Revista de la Asociacion Medica Argentina, Buenos Aires

July, 1918, **29**, No. 164

100 *Gastro-Enterostomy for Simple Ulcer. C. B. Udaonda.—p. 5.
101 History of Hygiene in Argentina. E. R. Coni.—p. 15. Cont'n.
102 *Partial Colectomy. D. Decoud and G. B. Arana.—p. 55.
103 *Angular Pregnancy. C. Mönckeberg.—p. 69.
104 Pelvic Gummatous Cellulitis. M. R. Castex.—p. 84.
105 *Treatment of Inaccessible Fistulas. A. Turenne.—p. 95.
106 Tuberculosis. J. J. Viton.—p. 108. To be continued.

100. **Remote Results of Gastro-Enterostomy for Simple Ulcer.**—Udaonda reports the remote results in twenty-two out of seventy-one operative cases of simple, noncomplicated gastric ulcer followed for from one to four years. Only 27.24 per cent. are free from stomach disturbances. All the others have had the old subjective symptoms return, as severe as before and as rebellious to treatment. The symptoms returned after intervals ranging from three months to two years; the average, between the sixth and tenth months. There has been hematemesis in 16 per cent. and occult blood has been found in over 86 per cent. The gastro-enterostomy opening seems to be working perfectly in all. Only in one case is there suspicion of syphilis, and there is nothing to suggest jejunal ulceration in any case. In his nonoperative cases, fully as good results were obtained with medical treatment alone.

102. **Colectomy.**—Decoud and Arana report two superposable cases in which a tumor compelled resection of part of the ileum and colon. Stereoscopic radiography aided materially in the diagnosis.

103. **Angular Pregnancy.**—Mönckeberg describes the anatomic conditions involved as the fetus develops in the tubal angle just inside the uterus. In diagnosing this site, the hardening of the tumor as the uterus contracts is instructive, also that the tumor is on one side and toward the front, while the round ligament lies outside of the tumor when examined under an anesthetic. The angular pregnancy tumor also

feels soft in comparison to the hard or fluctuating tubal pregnancy tumor. On suspicion of an angular pregnancy, expectancy should be the rule. By the fourth or fifth month the uterus regains its symmetrical outline and the pregnancy runs the usual course. It is better in a dubious case to annoy the patient by examination several times in succession instead of overhasty decision to operate on assumption of a tubal pregnancy.

105. **Inaccessible Vesicovaginal Fistulas.**—Turenne reports gratifying success in two cases of this kind in which he applied the technic described in 1910 by Gray-Ward.

Revista Española de Medicina y Cirugia, Barcelona

September, 1918, **1**, No. 3

107 Nephrolithiasis and Roentgen Examination. R. Lozano and E. Pastor.—p. 109.
108 *Slow Malignant Endocarditis. G. Roqueta.—p. 116.
109 *Improved Histologic Staining Technic. P. del Rio-Hortega.—p. 124.

108. **Slow Malignant Endocarditis.**—Roqueta's patient was a young woman whose father had succumbed to angina pectoris, and whose sister and brother present mitral lesions. She had two attacks of appendicitis in 1917, and the endocarditis followed close on the removal of the appendix, with death in seven months. A colored plate shows the numerous colonies of the *Streptococcus viridans* in pure culture from the blood.

109. **Improved Staining Technic.**—Rio-Hortega gives the details of a method for staining histologic specimens with an ammoniacal solution of silver carbonate, prepared with lithin carbonate from silver nitrate. The details of structure are shown up, he says, much clearer than with the classic technics. It is particularly useful in amylosis and in study of nerve fibers and tumors.

Revista Medica del Rosario, Argentina

August, 1918, **8**, No. 4

110 Urinary Stones in Children. J. M. Maidagan.—p. 273.
111 Hygiene of the Eyes in School. F. S. Schleisinger.—p. 293.
112 Abdominal Shock. L. Tixier.—p. 318.
113 *Amenorrhea after Roentgen Exposure. Siquot.—p. 322.
114 *Chorea. V. Ortiz.—p. 323.
115 Ankylostomiasis. C. Muniagurria.—p. 325.

113. **Roentgen Amenorrhea.**—A girl of 14, robust and of a good family, swallowed a needle, and was examined for half an hour with the roentgen rays, which entailed a severe dermatitis. She had been menstruating regularly for nearly two years, but since the roentgen exposure there has been no menstruation. The third month she began to have severe headaches and at times abdominal pain, especially in the left flank. Ovarian treatment, mustard foot baths and purgatives, applied at the approximate menstrual dates have given no result to date.

114. **Chorea.**—Ortiz emphasizes the prompt cure under sodium salicylate in the two cases reported.

Revista Medica del Uruguay, Montevideo

July, 1918, **21**, No. 7

116 *Diagnosis of Incipient Tabes. P. Scremini.—p. 345.
117 *Disinsertion of the Mesentery. L. Merola.—p. 366.
118 Blindness from Thyroid Deficiency. J. C. M. Fournier.—p. 382.
119 Primary Hemiplegia. P. E. Nuñez.—p. 395.
120 Favorable Experiences with Thymic Acid in Treatment of Cholelithiasis. J. S. Larraya.—p. 402.

116. **Diagnosis of Incipient and Incomplete Tabes.**—Scremini ascribes decisive importance to the lumbar puncture fluid for the diagnosis of tabes, even when the Wassermann reaction is negative. Changes in the cell content, chemical and biologic changes, isolated or alone, reveal the chronic syphilitic meningitis, and suggest impending or established tabes. The diagnosis may thus be possible in the preclinical phase. He insists that search for syphilis should be the routine preliminary in every case of nervous disturbance, whatever its nature. The Argyll Robertson is an almost certain sign of syphilis.

117. **Disinsertion of the Mesentery.**—Merola describes a method of access to the retroperitoneal region which retraces, as it were, the steps of embryonal development. His illustration shows how this *pan-operatoria retroperitoneal* allows the entire adult mesentery with the ascending mesocolon and half of the transverse mesocolon to be detached, with the branches of the superior mesenteric artery—and all this without hemorrhage.

Semana Medica, Buenos Aires

June 13, 1918, **25**, No. 24

121 *Infant Death Rate. U. Fernandez.—p. 657.
122 *Liver Incompetency and Surgery. A. Gutierrez.—p. 661.
123 Guinea-Pigs in Testing for Tubercle Bacilli in Milk. E. Fynn.—p. 669.
124 Order of Examination of Respiratory Apparatus. A. Viton.—p. 670.
125 *Medical School Inspection. E. R. Coni.—p. 672.

121. **Infant Mortality.**—Fernandez states in this address on puericulture that the death rate of infants under 2 averages 35 per cent. of the total mortality in all countries. Argentina with its 36 per thousand natality and 15 per thousand general mortality ranks high among nations, but the infant death rate is high, 21 per cent.

122. **Insufficiency of the Liver from Surgical Standpoint.**—Gutierrez gives at noon a pill of 2 mg. of methylene blue to test the functional capacity of the liver. The urine is examined at 9 p. m., 7 a. m. and noon. The findings in six cases are listed to show the great value of the information thus derived, in regard to the functioning of the liver, and as a guide to the surgeon.

125. **Medical School Inspection in Argentina.**—Coni remarks that the Argentine Republic was the first country in Latin America to introduce hygienic and medical school inspection. This was in 1881, and in 1886 the national board of education officially appointed two physicians for the purpose, and the number has been constantly increasing since. Chile introduced medical school inspection in 1900, appointing a woman physician as the official school inspector. Dr. S. B. Rodriguez introduced it several years ago in Uruguay. In Brazil the cities of Rio and S. Paulo have had official medical school inspection since 1912. Coni outlines the next steps to be taken for the welfare of the young.

Siglo Medico, Madrid

Aug. 3, 1918, **65**, No. 3373

126 *Enteritis and Colon Bacilli. D. F. Murillo.—p. 609.
127 Experimental Stimulation of Pneumogastric Nerve. M. B. Garcia.—p. 611. Cont'n.
128 Fatal Hemorrhage a Week after Stab Wound of Spleen. J. Palancar and S. Pascual.—p. 615.
129 Public Health in Spain. C. M. Cortezo.—p. 624.

126. **Acute Enteritis at Madrid.**—Murillo reports a familial epidemic of acute enteritis in which he isolated from the stools bacilli which seemed to be intermediate between the colon bacillus and those of the typhoid group. The toxin generated by it was exceptionally virulent, but there were no deaths and the cases were scattered over nine days.

Vida Nueva, Havana

June, 1918, **10**, No. 6

130 Hygiene for Munitions Workers. R. de Castro.—p. 173.

August, 1918, **10**, No. 8

131 *Quinin as Palliative in Cancer. V. Delfino.—p. 226.
132 Artificial Plasmogenesis. I. Castellanos.—p. 230.

131. **Quinin for Cancer.**—Delfino does not report any specific case histories, but expatiates in general terms on the great improvement in malignant disease under systematic deep intramuscular injections of small doses of quinin, well diluted, according to Castaigne's technic. The malignant disease proceeds on its inevitable course, but the cancer loses its distressing features, he says, and the patient is immeasurably relieved, possibly buoyed up for months with an illusion of recovery.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

July 27, 1918, **2**, No. 4

133 Industrial Accidents and Free Choice of Physician. J. A. Korteweg.—p. 301.
134 The Coarse Bread Question. E. C. Van Leersum.—p. 317.
135 Influenza? A. A. G. Land and A. A. S. Sluijterman.—p. 322.
136 Atypical Mumps. C. H. Nijkamp.—p. 323.